

ECUADOR
THE UNKNOWN



FLAMINGO ROCKERY AT THE GALÁPAGOS ISLANDS

ECUADOR THE UNKNOWN

*Two and a half years' travels in the
Republic of Ecuador and Galápagos
Islands*

by

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CHECKED

*Illustrated with photographs by
the author*



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FOR
CHRISTINE INEZ BROOKS
WHOSE CREATIVE SYMPATHY MADE
POSSIBLE THE DARWIN MEMORIAL
AT THE GALÁPAGOS ISLANDS

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CHAPTER I

ECUADORIAN KALEIDOSCOPE

LOOKING back on our trip to Ecuador, I have tried in retrospect to pick out some of the causes that created it. The trek just seems to have grown out of a jumble of reasons. But, in the main, those compulsions which drew us to that small South American Republic which lies athwart the equator were two : financial and scientific. The depression had caused Ecuador's currency to drop until its sucre was ten to a dollar, which, in the depths of the depression (it was then 1934), would make exploration relatively inexpensive. The other, more important reason was that Ecuador owned the Galápagos Islands which lie only six hundred miles off the mainland, in the Pacific.

As a young naturalist, always deeply interested in the Galápagos, it is not strange that a chance re-reading of Charles Darwin's *Voyage of the Beagle* should have fired my imagination and crystallized plans to visit them, and, as I am so formed that an idea is only half an idea until it is acted upon, I at once announced to my wife, Christine, that we must go to the Galápagos Islands. Moreover, the islands had much of their original fauna from the mainland, and it was also natural that Ecuador should be explored too, to form a basis for comparison.

But it was not so natural to Christine. Had I not remarked after returning from a long trek into Mexico that now, having acquired a wife, I longed for all of the luxuries of a sedentary life, with time for writing up my reports on the termites of Mexico? Now, six months had hardly passed and I wished to be off again.

Using all the tact I hoped to use later on the sh natives, I managed to infect her with some of my enthusiasm. The coming year, 1935, would mark the hundredth anniversary of Darwin's voyage to the Galápagos. What changes had taken place on those islands during the century? What had Darwin seen there in 1835 that had changed him from a young man of dubious future into the titan of the theory of evolution?

Because the Galápagos Islands lie outside the lanes of maritime traffic, the only practical way to get there is in your own boat, but having no spare yachts lying around, the best we could hope for was to charter a boat, as inexpensively as possible, in Ecuador. Knowing, however, that things move slowly in Latin America (and as our plans for the Galápagos Islands were no longer the simple ones which we first imagined) we decided to give ourselves a year's leeway in which to find a vessel and make our arrangements for the trip to the islands. Meanwhile, we could utilize this time investigating the biota of Ecuador in its relation to the Galápagos.

The Ecuadorian Consul in San Francisco furnished us with a few brief and confused statistics about his country: it was either 120,000 or 400,000 square miles in size; the population was either two or four million; and the monetary exchange see-sawed up and down so much that one was never sure what it was. He assured us though that we could count on ten Ecuadorian sucres to one American dollar at least, and perhaps more.

We would find, he informed us, that everything in Ecuador would assist the researches of science. In fulsome Castilian he promised that everything would help us, even the insects that I wished to collect, although it seemed a bit ludicrous to him that I should wish to journey all the way to Ecuador to collect that which Ecuadorians spend their whole lives avoiding.

Thus superbly prepared with fancies, if not with facts, we sailed for Ecuador, my wife to collect plants, and I to study the distribution of insect life in that

country, and to determine the effects of geography on their biology.

It is, however, with neither insects or plants that this account of our adventures is principally concerned, but with the people of Ecuador and the effects of a violent landscape upon them.

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We had expected to find Ecuador a land of contrasts ; for a country split across by the equator and cleft in half by the precipitous Andes could be nothing else. Yet we had not imagined snow-covered volcanos rising from the depths of the jungle, or bleak Andean steppes alternating with fertile valleys. For Ecuador is violent in its contrasts of coastal plain, lofty Andean prairies with Amazonic jungles : and the violence of this terrain has been reflected in its turbulent political history, which contrasts so strangely with the gentle manners of its inhabitants, whether they be aristocrat or savage ; for the remnant of the Spanish nobility rub shoulders on Ecuador's narrow sidewalks with Cholos-mixed descendants of the Conquistadores and the Indian races they conquered, as well as Negroes who mostly came from a wrecked slave ship on Ecuador's coast. Present too are the pure Indians representing all phases of primitive culture, all sandwiched together in this ethnic potpourri like the Ecuadorian landscape in violent tiers of dissimilitude.

Everything, the politics, economy, and the culture of Ecuador, has resulted from the cleavage of the Republic by the Andes, creating a dualism between the *serrano* (highlander) and the *costeño* (lowlander) which no government since the Incas has been able to reconcile. For the Inca achieved this unity because communications were expediently based on a longitudinal concept, while the Spanish concept was (and still is) latitudinal, forcing them to attempt with heroic efforts, to bridge the awesome gap between the low coast and lofty Andes.

Even to-day communications are frequently interrupted and it is one of the reasons why the *costeños* never agree with the mountain people. Rare is the moment in their political life when one geographical unit can move in harmony with the other so that the motto of the Isthmus of Panama—'the land divided, the people united'—does not serve here. Yet, these differences and contrasts are what make up this Ecuadorian kaleidoscope with all its varied colour and culture, into one grandly confused mosaic: and the entrepôt of this tropical kaleidoscope begins at its only real seaport, Guayaquil, sixty miles up the Rio Guayas.

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Our vessel dropped anchor in the turgid, muddy river opposite Guayaquil. The morning was still pink with the fragments of a tropical dawn as the sun broke through, lighting up the long row of buildings on the Malecon. In the soft light, the waterfront seemed to be lined with long rows of beautiful buildings of marble and polished stone. It was very different from what we had been led to expect in view of those who called it 'the pest hole of the Pacific.'

Here appeared a row of palaces, balconies with brilliant awnings set off by palms waving gently in the soft morning breeze—we were transported to the waterfront of an Algiers or a Constantinople.

As we leaned over the rail of the ship, we could see large floating gardens of blue water-hyacinths hurrying by, being carried out to sea by the ebb tide. In mid-stream, ships straining at their anchors, turned lazily with the change of tide. One small German coastal liner was taking on the produce of Ecuador—little brown men, sweating freely, carried up the cargo from large wooden lighters tied to the side of the ship—copra and cacao beans went up in sacks; Panama hats in tightly rolled bundles were hoisted with care, while at the bow, a revolving elevator lifted up an endless quantity of green bananas.

At a double blast from our ship's whistle, innumerable small craft set off from the waterfront as if they were competing in a race. The short staccato explosions from the Diesel motors cracked in the morning air like pistol shots. A flock of snow-white egrets, disturbed by the noise, rose and flew to the other side of the mile-wide river.

The water-taxis dashed to the gang-plank, piling up in the surging tide, one against the other. Negroes in soiled white pants dashed up the gang-plank, while others, less dark, showing the mixture of negro with indigenous Indian, broke the morning's calm by shouting :

" Taxi, meester ? Cum theese way. My boat is the best."

" Taxi ? "

There was a frantic gesticulating below as the men tried to get our attention. A uniformed immigration officer, smartly attired in white, saluted us :

" Your passports, señores. You may now debark."

This was the signal to a group of swarthy *mozos*, hanging on near the ' stairs,' to rush upon us and seize our bags. We followed them down the gang-plank. The small boats bounced so furiously with the surging current that the only thing we could do was jump. Christine gauged the distance and leaped. I followed close behind, taking a death grip on the pitching boat.

On our way to the waterfront our boat dodged through a heavy traffic : canoes in profusion poured down from the rivers above to Guayaquil, which is the mouth of a tropical cornucopia. Dugouts drifted by, carrying melons, anonas, and large artichoke-shaped chirimoyas, which are regarded by gourmets as nature's supreme synthesis of strawberry and melon. One dugout even came close enough to us for its owner to toss some damson-like melons to the crew of the water-taxi. We swerved one way and then another to avoid the flat-nosed balsa rafts, piled high with oranges, and coconut-filled canoes with tattered white sails. To escape the full force of the ebb tide, our boat veered to the shore and crept close to some large rafts of logs which were tied to the bank. On the rafts were built

the owner's palm-thatched houses, complete even to a crude stove.

"Our floating population," the pilot informed us with a wave of his free hand, "they float up and down with the tide. Pretty easy life, no?"

We climbed out of the boat at the bottom of a flight of concrete steps that extended into the river from Guayaquil's Mole, and mounting them we saw a phalanx of commercial houses, hotels and foreign consulates stretching along El Malecon, the principal boulevard.

Behind this façade of affluence lay Guayaquil proper. Then we saw that we had been deceived. Guayaquil was not composed of buildings of marble or stone at all, but of small buildings, two or three stories high, roofed with tin sheeting over plastered walls, painted white, blue and pink. What we had thought to be imposing structures of marble proved to be simple shells of plastered bamboo, trimmed with ornaments of stucco and painted to simulate marble. From the vessel we had seen long, highly decorative portals, arcades, sheltered balconies, rows of balconied buildings that awoke romantic imaginings—but what, alas, was this we found?—many of the apparently marble buildings had lost their paint, exposing the skeleton of the structure which made them look like the dilapidated scenery of old-time vaudeville. Even the Cathedral, which had looked so imposing from a distance, we found was made of a wattle of bamboo plastered and painted like the rest to resemble stone.

But it had not fooled the termites. They had perforated its wooden walls until it looked as if it had been riddled with bullets.

The illusion of the buildings was, in a sense, a lamentable symbol of the hollowness of this thriving commercial city which was for us almost completely lacking in interest. This lack of interest was confirmed by the tourist agencies who can think of nothing to see in Guayaquil save the cemetery. After we had exhausted our interest in two days, we decided to leave for the highlands.

CHAPTER II

THE TRAIN TO THE CORDILLERAS

TO entrain for the highlands is not exactly a simple procedure, as we very shortly discovered. It is not just an ordinary train trip for which one casually enters a station and calmly sets off for the Sierras. There is as much drama connected with each departing train as if it were the last to leave a besieged city. To begin with, we found that there were but three trains a week, running Monday, Wednesday, and Friday. All services, either to or from Quito, is wholly stopped on Sunday, and trains do not run at night. Consequently, there is an accumulation of passengers and freight on the trains which do make the trip.

Although originally Guayaquil had been planned as the terminus on the coast, the ever-present political and financial difficulties made Duran, across the river from the port, the actual railhead. All we had to do was see that our luggage and ourselves were transported by ferry across the Guayas to the station.

The evening before, I had engaged a *fletero*, or porter, to carry our bags to the ferry and place them in the proper car on the other side. There were no fixed prices for such services and the *fletero* quoted a price three or four times the 'normal' rate, and we, having been advised beforehand, underestimated, grossly, the number of our bags. By agreement to pay half the quoted price, a settlement was made and the boy was waiting the next morning at the foot of the hotel stairs.

We arose sleepily at 5.30 a.m. Day had not broken; the early rising had not helped my temper. I was not

in the least interested in carrying on the discussion I found myself involved in, as my *fletero* was already complaining about the number of pieces which I had not mentioned to him. I had been warned not to give in at this point and I told him firmly that : " everything will be arranged."

In the milling mob of people, we surged upon the decks of a small ferry-boat which transports Indians, peons, *Cargaros*, 'Gente Decente,' and freight, alike to the other shore. Before we arrived at Duran, we were told to jockey ourselves into position for the dash to the train. In our inexperience we had bought only first-class tickets. We discovered we must move quickly to secure seats. I should have purchased also reserved seats or observation tickets, which would have saved us the nervous strain of wondering whether or not we would be able to find space to sit down. There was only one egress from the boat. Already the crowd clustered so closely about the door that we were sure there would be no seats left. In the crowd, which pushed and shoved, were Indians with brown smiling children tied to their backs and baskets juggled precariously on their heads. The *fleteros* with the baggage were crowding along with the 'Gente Decente' who vociferously complained.

The ferry had not docked before passengers began to leap over the side, and rush for the train. This was a rather perilous stratagem, as the swift Guayas, with its undertow, would drag anyone below at once should he miss the dock. When the boat was pulled into place, and this took no end of manœuvring, despite the fact that this feat is accomplished many times a day, the passengers were so crowded at the bow of the boat that the gang-plank could not be lowered. The rush was as violent as that in a New York subway, save that the pine-apples, bananas and chirimoyas swinging about gave the scene an odd and decorative note. Squawking chickens and crying children added to the cacaphony.

A native woman in front of me, being hard pressed, gasped, looked about, and handed me her child with a

"con permiso, señor" (with your permission). Letting herself sink to the floor, as if she were in some sort of conjuring act, she disappeared entirely, her progress marked on the floor by several persons giving visible starts and looking to see what was crawling below them, I was too astounded to do anything but hang on to the child so unceremoniously dumped on my hands.

Returning, the native woman bobbed up on my other side saying triumphantly: "Los pollos." She held three chickens tied together by their legs. In order not to lose her place she had pressed me into service while she recovered her chickens. Rewarded with a "Muchas gracias, señor," I transferred the child to its mother just as the gang-plank was put down. I could see Christine out of the corner of my eye, enjoying my discomfiture hugely.

Still we did not move. Like clumsy pachyderms trying to pass through an entrance large enough for one only, two *fleteros* were caught in the narrow door with their baggage. Neither one would give way. Many of the passengers climbed over the rails and dropped down to the dock, six feet below them.

By good play of elbow and leg, I finally came to the seats on our train and took possession of them, while Christine and the luggage followed. The *fletero* placed our baggage about the car and came for payment. There was the gentle to-and-fro of bargaining, and eventually I paid a reasonable sum to the *fletero's* satisfaction. All this could have been done in the first place, but the ritual of Hispanic-American transactions is otherwise, where two unreasons make a rational.

An officer of the army of the Republic of Ecuador behind us was not faring so well. Attired in the smart blue-grey uniform of the Republican Army, he stood sullenly in the aisle with his hands resting on his sword. He and his *fletero* had reached an impasse. The officer refused to pay more than one sucre, the *fletero* wished five. The officer offered one sucre; the lad refused the proffered money and remained adamant. The captain,

at first muttering under his breath, raised his voice and began to tell us the whole history of the negotiations, flaying the *fleteiro* system from its beginnings.

"We live like brutes," he complained. "Why cannot we have an established price for transporting our baggage?"

The passengers who heard him nodded their heads in assent. Even the *fleteiro*, overcome for the moment with the captain's eloquence, nodded his head, but remarked after the harangue that the price remained five sucres.

The disputants were overwhelmed by newly arriving passengers, and the poor captain was perfunctorily swept into his seat by a fresh deluge of baggage.

At the train's sudden start, there was a mad rush for the exits. We were surprised to see that there were, after all, only relatively few passengers—that the train had been filled, mainly, with friends, wishing the travellers 'Buen viaje.' The train's movement was a false start, and people (obviously relatives) flocked about one young man going the whole distance to Quito. Although it seemed silly to us, there was a reason for this much ado about nothing. Whoever leaves for the interior, if only for a few weeks, is brought to the station by his entire family and friends. There is more than mere sentiment about such demonstrations; there is also inbred memory and experience.

Years ago, before the railroad, to travel from Quito to Guayaquil meant a horseback ride of eight days; it meant passing through the storms of the high altitudes and possibly encountering robbers. On the coast, worst of all, there was yellow fever, bubonic plague, typhus, typhoid, and malaria, to mention but a few of the dangers. When, therefore, someone was to make this journey, he settled his estate. To his family it seemed indeed a last journey to the Campo Santo, the burial ground. So much did this become a part of the psychology of the people that they cannot now regard the voyage as simple and ordinary, causing a clash of a mechanical epoch with the simple past.

At last we started across flat fields inundated by the intertwining tributaries of the river. The tall marsh grass hid great flocks of white egrets that rose un-
hurriedly with the train's approach and settled down
elsewhere. Fifty-seven miles of this and we came to
Bucay at the base of the Andes. Here surplus cars were
dropped, a powerful engine attached and we followed
the gorge of the Chan-Chan River. Occasionally, as the
heavy fog lifted, we saw the imposing heights of the
Andes and were awed by the colossal heights, a violent
contrast to the flat land below. Long glimpses of the
high Cordilleras were not possible, for the train had begun
its climb and there was a constant shifting of perspective.
As the train followed the gorge, we rose rapidly. We
felt the exhilaration that comes with a slight rise of
altitude. The lush country disappeared and gave way
to the rocky foothills of the Cordilleras which support
only the most bizarre grey-green succulents. As we
twisted and turned, following the gorge of the Chan-
Chan, we left all signs of human habitation behind. The
passing grandeur of the foothills of the Andes was our
only distraction.

At noon we stopped at Huigra, the railroad centre, at
6000 feet altitude. The train carried no dining facilities,
and we had the choice of either eating the meat pies
called *empanadas* or fried chicken (covered with globules
of red-tinted grease) held up by Indian women in
banana leaves, or trying our luck at one of the restaurants
of which Huigra mainly consists.

Near the station is the grave of Arthur Archer Harman,
of the brothers Harman, who began the work on the
railroad in 1897. Virginians, the one trained as a
military engineer, the other a financier, they ran the
gauntlet of the twin scourges, fever and revolution, to
throw this column of steel to the capital. Before the
railroad, Ecuador had no transportation system other
than the mule. Under General Eloy Alfaro and the
Harmans, Ecuador began its modern phase. There
were immense difficulties, to be sure. The grade was

steep, the gorge, on which they planted their rails, uncertain, and fever in the lowlands took a dreadful toll of lives. Legend has it that a life was lost for every tie in the jungle section of the railroad. Though undoubtedly a gross exaggeration, it serves none the less to emphasize how little was known, before the Panama Canal was built, of tropical medicine and the maladies of the hot lands.

An hour's climb from the station at Huigra brought us to the celebrated Nariz del Diablo, the Devil's Nose. This almost perpendicular ridge, arising out of the gorge of the Chan-Chan River, is about one thousand feet. It seemed an insurmountable barrier to the engineers, who finally resorted to the trick of the switchback or 'zigzag' system, an engineering expedient which the American, Meiggs, used with success on some of the lofty peaks of Peru.

Christine and I left the train at Sibambe, below the ridge, for we were bound for Cuenca, which lies in the south of the Republic. Quito, the capital, is to the north, some one hundred and seventy-five miles. As we stood below, we could see the train zigzagging up the 'Devil's Nose,' where, having once gained the ridge, it begins another long steady climb to the lofty moorlands of the Andes.

CHAPTER III

CHIMBORAZO AND THE PARAMOS

WE first glimpsed the Volcano of Chimborazo as our little motor-tram-car climbed the narrow-gauged road in the direction of Cuenca. Towering 21,000 feet above sea-level, the last 5000 feet draped in an awesome permanence of snow, Chimborazo is the frigid sentinel leading to the greatest spectacle of the western hemisphere: the Ecuadorian Andes, topped by sixteen snow-covered volcanoes all within sight of one another.

It was late afternoon and the penetrating cold at 10,000 feet passed through our woollen garments as if we had on no clothes at all. Chimborazo's cold magnificence did nothing to warm us. This monstrous volcano, whose pink-tipped summit caught the rays of the setting sun, did more to distract us at the moment than the swaying car, running on the edge of the yawning *quebrada*, and it was well that it did. The trip to Cuenca is not for weak hearts. We came up from the hot lands after rising at 5 a.m., and by afternoon we were in the high altitudes following the abyss of the Andes. Everywhere in these vast peaks there are contrasts of heights, depths, peace, and tumult. There are both blackness and brilliance, symbols of the eternal conflict between the Princes of Light and Darkness. But even at these heights our eyes could follow the corn and potato fields of the Indians up to the snow line. In the arid wastes of the lofty *cumbres*, the purple flowers of the potatoes were the only relief of colour in the grey expanses of ichu grass and twisted grotesque lava masses.

Eventually we climbed to 11,000 feet, the highest point on the tiny railroad. We were in a region known as the *paramos*, a flat, veldt-like desert region, above the timber line. I know of no parallel so fitting for this frigid region of the high Andes than 'the tundra.' The tundras in the northern Arctic regions mark the limit of arborescent vegetation, but in its mucky black soil and permanently frozen subsoil it supports mosses, lichens, shrubs and dwarf herbs. Blindfold an Alaskan, transport him to the *paramos* in the Andes, even if it be on the Equator, undo the blindfold and ask him where he is and he would undoubtedly say the Russian word, "Tundra!"

In the bad season severe cold and fierce gales beset these high moorlands. With the wind comes fog and then hail as large as marbles which soon pelt man or beast into insensibility. To the mountain dweller, the word *paramos* has come to mean both the fog and the moorland, and is used interchangeably in their conversation. It is not uncommon to hear the *serrano* say, "We must now cross the *paramos*," meaning the moorlands on the Andes, and again to hear him say, "Now comes the *paramos*," referring to the rolling banks of heavy fog that descend in the afternoon.

Potatoes grow poorly at this altitude, and even barley, that hardy grain, will not yield. It is not the world for men. All the mountain peaks over 16,000 feet are covered with perpetual snow, and as the wind blows from the north, the frigid cold of this region is swept across these Andean prairies. A few plover, some gulls living in the small Andean lakes, and rodents, are the only living creatures.

The Andes that day looked as if they were only recently poured from the bowels of a burning furnace. The lava seemed to have been formed only yesterday instead of æons in the past. Erosion of the rock at this altitude is negligible and the vegetation so scarce that the rocks retain their pristine brilliance. Yet, thousands of years have passed since the rugged backbone of South

America lifted its gigantic mass. Colombia to the north was endowed with a complex series of Andean ranges as was Peru to the south. Ecuador, fortunately, fared differently.

Here there are only two ranges forming a broad chain that runs the length of the Republic. Between these two parallel ranges known as the Cordilleras there is a lower elevation, generally about 8000 feet in altitude, which is in the temperate zone. Within this narrow region, never exceeding thirty miles in width, and running continuously from the north to the south of the Republic, are the largest of Ecuador's cities. Here, also, the ancient civilizations of the Andes took root.

However, this description of the great inter-Andean valley is over-simplified, for a series of transverse ranges, locally known as *nudos*, or knots, divide the Andean chain. In order to pass from the valley of Cuenca to the valley of Riobamba, therefore, one is forced to cross the *paramos*. Because of this the Republic has no railroad system that connects all of the inter-Andean cities, at least, no railroad from north to south.

We grasped at once our good fortune in choosing Ecuador for exploration, for no country, to our knowledge, embodied so compactly, and in such a short space of time, such a diversity of climes. The humid tropical regions of the lowlands gives way to the sub-tropical zones, and these in turn yield to the frigid *paramos* region. Often the *paramos* ends suddenly as if it had been hacked off by a gigantic machete, leaving a labyrinthine chaos below.

Although the train was marked 'Siabambe-Cuenca R. R.,' these names had nothing to do with the railroad's actual destinations. The term is political idealism. The railroad was meant to go to Cuenca, but it never got there. Tambo (which is the actual terminus), in Quechua, means hostelry, for a *tambo* in the time of the Incas was a well-garrisoned stone building with a grass-thatched roof. It was a resting place for the messengers of the Incas, the ambassadors of the Children

of the Sun, who were made welcome on their trips to the remote sections of the kingdom. We are told that everything was there for their comfort, and that the inhospitality of the *paramos* regions passed just as soon as the travellers entered the portals of the *tambo*.

The Inca would have been aghast at modern Tambo, for a more cold, disagreeable, desolate settlement could hardly be imagined. There were approximately fifteen buildings; two called, for lack of a more fitting word, hotels. The streets were muddy and the miserable Indians that crowded about us seemed to be animated bundles of rags rather than men. The once brilliantly dyed woollen ponchos, which were thrown about them, were patched with various colours, and askew on their dishevelled heads were felt head-gear, grey and dirty, like gigantic mushrooms. Even the native Ecuadorians, who make the trip to Quito or Guayaquil from Cuenca, abhor the thought of coming to Tambo or spending a night there. The cold was piercing. I threw a woollen poncho about Christine, but her teeth chattered as if she were bathing in ice water.

Rather than wander in the mud, which was ankle deep, we remained in the tram-car while Indians gathered on the cars, chattering away in what I thought at first was Quechua. Suddenly a few words of Spanish that I could understand struck my ears—I realized they were speaking Spanish, but of a southern Ecuador variety known as Cañar Spanish. This dialect is sibilant and lisping like the highland Indian's Quechua, which almost all speak—Indians and whites alike, in Southern Ecuador. The 'sh' sound is common in Quechua, and it has crept in, nay, it has absorbed the Castilian tongue. The 'sh' is tacked on almost anywhere. 'Si pues,' meaning 'yes indeed,' becomes 'Si pish.' The Cañar-Spanish tongue sounds more like a constant hissing in which a few Spanish words become audible. In addition to these vocabulary difficulties the *serrano* uses the diminutive ceaselessly. A *sucre* (the national coinage), becomes a *sucre-cito*, a *señor*, a *señor-cito*. Despite the fact

that I towered over a minuscule old Indian, he asked me "if the little-señor would little-mind if he, the little-old man, could remove the little-baggage?"

While waiting for a Ford touring car to be packed with our baggage (for we planned to travel to Cuenca at night rather than stay at Tambo), we went into a small windowless house where we were told we might get some coffee. On the bare mud floor a baby, clad only in a short jacket, was playing. He was bursting with health and positively gargantuan in size, an animated contrast, with his ruddy cheeks and happy smiling face, to the spindle-legged children we had seen on the coast, with their stomachs swollen from worms. It was a perfect illustration of environment and the effects of geography on the health and disposition of a people. Here was a little two-year-old baby sitting nude upon a cold mud floor, while we shivered, despite all our woollen ponchos.

Christine quickly noted the reason for the dress of the young children of Ecuador, whether they lived in the lush lowlands or the freezing highlands. The small jacket was never augmented, in the child's earlier years, with pants of any sort; when the child had to answer the call of nature it merely responded on the mud floor where it played; and the mud, true to its permeable nature, graciously absorbed the moisture. It was such a remarkable exhibition of expediency on the part of the parents and the pants-less, diaperless children and the permeable mud floor that Christine believed she had found the very beginning of animal expediency. What a concatenation of cause and effect—remove one element, substitute a wooden or a cement flooring for the mud one, and the whole chain of behaviour would be changed.

The owner of the house, his wife and innumerable children, stood about inquisitively asking us very personal questions: "Where did you come from? Where are you going? Have you any children? How wonderful it is to be from 'El Norte' where every one is rich and all can travel."

And to the well-meaning, kindly man we answered all this as best we could ; Christine even going so far as to respond in kind, asking about this resident of Tambo and his world. Since Christine did not speak Spanish, I translated her questions to our host and then his curious answers back into English. What struck Christine's curiosity at once was that in the bare one-roomed house there was only one bed, yet there stood about us, man, wife, and eight children, all of different sex and age. Where did they all sleep ? I managed to put this question to my host. Did some sleep on the floor ?

"No, no, señor ; we all sleep in the bed."

"All in one bed ?"

"Si, si, señor, uno por todos—one bed for all."

Christine nodded with some apprehension and looked again at the family and then at the size of the bed, and thought it a point that might be brought to the attention of the Federal Housing Administration, for an expert packer would find some difficulty in making room for everyone in that small bed so that some would not sleep on the other. It was apparent that the birth-rate did not suffer from this nocturnal packing. However, even the most personal of questions must end somewhere.

I remembered that Richard Spruce, the English botanist who came to Ecuador in 1865, had a similar experience with Ecuadorian bundling. When he remonstrated with his host in the morning for allowing people of both sexes to sleep, not only in the same room, but in the same bed, Spruce's host drew himself up to his full height and said with wounded dignity :

"I assure you, señor, I assure you, we throw open both doors and windows at daybreak."

He had no idea, poor man, of any possible vitiation of the moral atmosphere.

CHAPTER IV

CUENCA

OUR way to Cuenca was over well-paved, crushed stone roads, lined mile after mile with a phalanx of cactus, eucalyptus, black cherry, fruited capulins and Gothic-crowned willows, through one fertile valley after another, finally emerging into a great valley near Cuenca which the Incas called Puacarpampa—the flowering plain.

The houses that spotted the landscape as well as those that were crowded together in the little villages, were soldily constructed adobe, with whitewashed fronts and roofed with brilliant red tiles, made by their owners.

We could see these red-roofed houses rise out of fields green with corn and purple with the blossoms of the potatoes, for an endless variety of tubers grow in Ecuador. In the centre of the ridge-pole of every house we saw a cross with devices symbolic of the Passion. And what a wealth of imagery! The cross was metal, and figured with it there was the spear, the sponge, the vinegar, that was given the dying Christ, all done in literal style. The effect was highly ornamental and indicated, to our surprised minds, the Indians' instinctive desire for religious expression.

The road was filled with Indians returning from the weekly fair. How colourful, how different were these people from those of the coast! Particularly noticeable were the Chola women. Their bronze faces, flashing black eyes, and high cheek bones, proclaimed their Indian origin, but their dress, different from that of the Indian, pointed out a class evolution. Ample-bosomed, broad of beam, the Chola women wore numerous skirts which swelled out their figures in crinoline effect,

and from beneath these numerous skirts flashed a small foot shod in black patent-leather pumps. As they moved along in groups on the road, with the peculiar rapid trot so common to the mountain people, they all seemed alike. They were all of the same height and wore low-crowned white Panama hats.

Each Chola woman was usually accompanied by a little Indian girl who carried her purchases, for the Chola caste does not 'carry.' This is left to the pure Indians who, unlike the middle class, have kept their ancient traditions of dress. The Indian women wore garish coloured woollen skirts and a shawl held closed in front by a silver pin called *tupú*, an ornament as old as Inca culture, and, to each Indian woman, a highly valued possession. They do not wear the Panama hat, but have a grey mushroom-shaped affair, askew on their heads; they go barefooted as do the Indian men. The children are miniatures of their parents, the same dress, the same hat, and on their backs in mimicry of their parents were small baskets into which an article proportionate to their size and weight is placed by their mother. The little child develops until at nine years of age he (or she) will be able to carry thirty pounds.

Cuenca, named after a city of old Spain, lies in a small valley at 8500 feet altitude. The cobble-stoned streets are laid out at right angles to each other, and the buildings that face the streets are small two-storied, red-tiled structures, simple and monotonous in their architecture. Around the square, which our hotel room faced, were grouped the principal buildings of the city, typical of colonial-Spanish town planning, not motivated by a hasty commercialism, nor a desire for ostentation. The well-built *cabildos* with their quaint façades, expressed the colonial's love of beauty and the desire to build solidly and well. Much of the solidarity of the buildings results from Cuenca, having been set up in the ancient realm of the Incas near the citadel of Tumipampa (Tomebamba) which furnished the Spanish conquerors (in 1567) with large well-worked stone.

During the colonial times, Cuenca was completely isolated, and to-day, although there are a number of automobiles (brought in sections and reassembled) as well as telephone service and electric light—most of the necessary conveniences of any modern city—Cuenca is not joined to the rest of the Republic by either direct railroad or highway.

One night's rest in the very comfortable Hotel Internacional removed some of the traces of the bouncing sixteen-hour trip we had endured the day before, and after the usual breakfast of hard rolls and black coffee we left the hotel early to search out the residence of an American to whom we had a letter of introduction from the American Consul in Guayaquil.

Although the thermometer seldom falls below fifty degrees during the day we felt as though it had reached the freezing point, and kept walking back and forth across the street as we proceeded, trying to keep always in the sun. While there we were very comfortable, but the moment we passed into the shadows a chill crept through our clothes. We passed only a few people in the street at that early hour, and these were so bundled in clothes that they were almost invisible. One bare-footed Indian unwrapped his face just long enough to point out the home of the 'Americano'—the usual Cuenca building with plain, large, bolted door. In response to our knock a cherubic-faced servant appeared. I held up my letter.

"I wish to speak to Señor Brandon."

The great door swung open and we walked into a lovely courtyard, riotous with Andean flowers. The Chola servant turned to me.

"Cubrese usted, señor" ("Put on your hat"), she urged me, and I realized that no matter how impolite it seemed I would be unwise to disregard the suggestion. Once acclimatized to the cool rooms I could uncover with impunity, but in the meantime it was as well to walk about with my hat on.

Mr. Brandon appeared reading our note of introduc-

tion. He was middle-aged, but showed few signs of advancing years, and was a picture of health, like most of the inhabitants of the Sierras.

"Nice to have you with us," he opened the conversation. "Americans don't get up here often. So you are on your way into the Upper Amazon? Well, I suppose it will be an interesting trip. I can never get away for such a thing. Taking care of the Panama hat industry keeps me glued to the spot."

After a few minutes of casual conversation we inquired about the banking facilities in Cuenca and Mr. Brandon offered to take us to the Bank of Cuenca, of which he was one of the directors.

As we walked along he told us something of the city.

"You will find this town the cheapest place to live in Ecuador, if not in the world. Your hotel, with food and room, should not cost more than a dollar a day for both of you. Clothes can be tailored here for as little as four dollars—that does not include the cloth, but good English woollens can be had for a very reasonable price, or there are some native woollens which are quite good, and a cut sufficient for a suit only costs about six dollars. I suppose you have already observed that you cannot purchase ready-made clothes here. Everything is made to order, most of the people doing their own tailoring. Of course, that is fine for the sewing machine business, and I doubt if you will find a house of any middle-class person here without a Singer sewing machine."

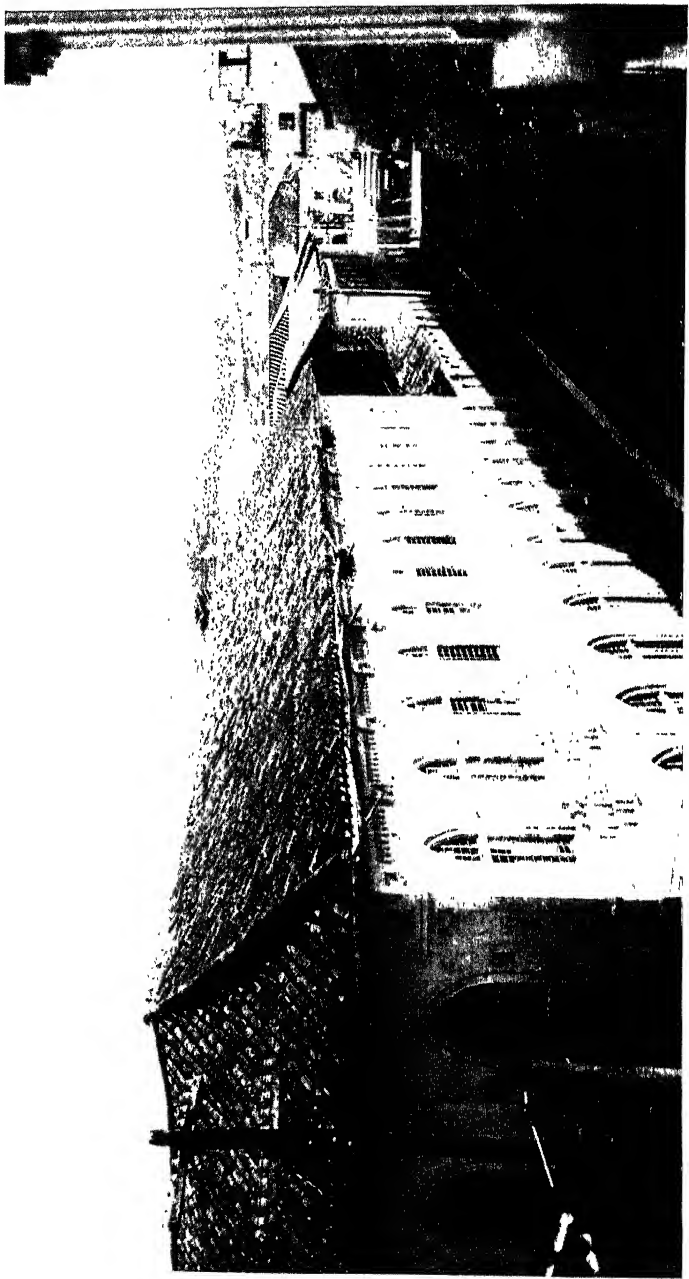
We came up to a number of monks standing on the corner and Mr. Brandon raised his hat to them while I followed suit. The frocked padres responded. There were Jesuits, white-robed Franciscanos, and flat-hatted Oblatos, all conversing on the street corner, and these and others that we passed proclaimed by their number and variety that the city was deeply religious, in contrast with the irreligiosity of the coast.

Mr. Brandon noting our look of askance said:

"Yes, there are plenty of those fellows around. I think there is something like a monk or priest for every



STREET CARNIVAL OF THE PANAMA HAT WEAVERS



STREET SCENE IN CUENCA

fifty people in the city. The conflict between the Church and State which affected all of Ecuador, sort of slipped by here. During the dictatorship of General Eloy Alfaro (the man who built the railroad) almost all of the Church property (it held about three-quarters of the property in Ecuador) was confiscated. He placed the property in the hands of a corporation which lumped all of it together. This is administered by selected officials who use the income for alleviating the wants of the poor. Under their care is an interesting experiment called the 'Gota de Leche'—the drop of milk, which you will want to see. Indian and Chola women bring their babies daily to one of the centres for free milk. The whole corporation is called the Bureau of Public Assistance and dispenses the sizable total of 230,000 sucres annually for its many activities.

"Still, the Church in Cuenca has a good hold, they retain much of their property. There is a Canadian Protestant missionary here now, sent down to convert the Catholics to 'Christianity,' which you might imagine does not go over very well in this city. This missionary, who is a good fellow at heart, used to go out every Sunday and harangue the crowds of Indians, dealing not too kindly with monkish superstitions. I don't know if the padres urged them or not, but one day the Indians got hold of the missionary on his return from picking up a few neophytes and stoned him. They left him lying in the road for dead, and we found him later that day pretty badly mused up."

"That must have just about ended his conversions, didn't it?" I questioned.

"No, no," answered Brandon, "he didn't stop, but he doesn't go out on the road any more. He has installed a loud speaker in front of his house, and when he sees a group of Indians nearby he lets go on the radio system and with his amplified stentorial tones the Indians think it is the voice of God. After three years he has one faithful convert."

The subject changed when Christine inquired: "Are

there any other foreigners in Cuenca besides you and Mrs. Brandon?"

"Well, yes, there are five of us," our companion answered, "the Canadian missionary, a Czechoslovakian, an Englishman, Mr. French, who represents the English interests in the Panama hat buying, and Schwindt, the plumber, a German, who is doing a land office business now since the communal hygiene laws have been passed. We're closing up the open sewers. See these gutters?" and he pointed to the wide stone gutter down which flowed all sorts of revolting refuse.

"These have been our sewers, now we are closing them and we are introducing toilets to the natives. After a long struggle to overcome the inertia of the Indian the Town Council issued an order that all water must come into the city in closed conduits. And to prevent typhoid all milk-cans must be well washed before putting in a new supply of milk.

"Oh, yes, the natives responded well enough. One day an inspector found some of the women washing their milk-cans, but not where it would do the most good. They were using the water from the open sewers. Water is water to the Indians."

Arriving in front of the bank we stepped back to admire a newly erected structure of polished Cuenca marble.

"Looks affluent, doesn't it?" remarked Mr. Brandon. "But the president receives the grand total of four hundred sucres a month salary, and that at the current rate of exchange is forty dollars, and it is the highest paid job in the city."

"Then," asked Christine, "how do they buy American cars which must certainly cost two or three times as much here as in the United States?"

"That, señora," Mr. Brandon said ironically, "is what a commission wanted to know some time ago. Of course living is very cheap here, but still, it is a miracle how they do it. I don't even own a car, and most of my money comes in dollars, which gives me a ten to one advantage over these people."

We adapted ourselves very quickly to the easy camaraderie of Cuenca. One Sunday morning I joined a group of men in their weekly promenade about the main plaza where the army band was giving its weekly concert.

The conversation of the group was worldly and witty, their radio and newspapers keeping them in contact with the outside world, for the Panama hat business held them very close to the realm of international affairs; fluctuations of the dollar or the pound were quickly felt in the purchase or cessation of orders for the Panama hat.

I walked between Mr. Brandon and a Cuencano who had been in the States. We conversed in English, and, when joined by other men, in Spanish.

Black is the dominant colour in Cuenca, for as it is a deeply religious city mourning customs follow explicit rules; three years for the mother and father; an uncle, one year; a cousin, six months. The formula is so pat that I wondered at their technique of estimation. Since everyone of good family in Cuenca is related to one another, seldom a week passed without the death of some relative.

I noticed one man walking in front of us dressed completely in black. His straw hat was black, tie and clothes and shoes also black. Mr. Brandon saw me staring at him and said from the corner of his mouth:

"You know that man even dyes his underwear black when in full mourning; goes the whole hog. It isn't so bad for the men here, they're used to wearing black, but awful for the women! There is a beautiful girl here that just had three smart dresses made, and before she had a chance to wear them a cousin died. That meant she would have to wait six months before wearing them. The last day of that mourning a grandmother died, and that means two years—two years before she can wear the dresses, and then the styles will have changed."

"Don't the Cuencanos who have travelled," I asked, "realize that they can't maintain so much formalism now?" Mr. Brandon thought for a minute, manoeuvred about the bandstand and answered:

"Formalism is the very heart of these people. Haven't you noticed how each one asks the same questions, speaks to you with the same solicitude, as if their hearts will be torn if you are not well and happy? That is very characteristic. I have lived here twenty years and know them all. I have even slipped into it. The servants do not escape from it. Once Mrs. Brandon wanted the return of some patterns from a lady of Cuenca and she dispatched her maid for them. As Mrs. Brandon is American she had forgotten the usual formal manner of greeting; she merely said, 'Give my respects to Señora Aguirre and ask her if she would be so kind as to return my patterns.' But do you know what the servant told Señora Aguirre?"

'Señora Brandon sends me to you and tells me to tell you that you are her little heart and the dear friend of her soul; that she is dying for not having seen you and begs that you come to see her—that she has been waiting for more than a week—and that she sends her deepest respects and considerations—and she asks how you are and how your husband is and how your children are—and whether they are well—and to tell you that you are her love and (this without stopping) that she would like to ask you to return the dress patterns that you borrowed from her three weeks ago and did not return.'

After our laughter had subsided I asked him why Cuenca, like many of the cities of Hispanic America, appeared to be in partial ruins. At first I thought that Cuenca had been subjected to a recent earthquake, so many of the structures appeared without roofs and had boarded doors.

Mr. Brandon told me the reason: a mere matter of finance. A man who wishes to erect a house never stops to estimate whether he has sufficient funds to complete the building, but builds until the money is gone. The unfinished house is then covered so that the adobe will

not be washed away by the rains, and there it stands until more money is forthcoming.

In the public buildings something of the same sort occurs. The University, for instance, has been partly built for years. Of the money given out by the Minister of Public Works, there is never enough to complete all the communities' projects, but the candidate is forced to accede something of his campaign promises. Spanish bravado always visualizes more than can be performed, and plans for the buildings are always more grandiose than the community can afford. The existence of a fine deposit of marble in the environs of Cuenca has recently been put to use, for there is now an apparatus for polishing it and cutting it. Consequently the homes are now being fashioned of the most sumptuous red marble. Even the stairs and balustrades of the University are wholly of Cuenca marble.

One structure in Cuenca is unique. Facing the plaza it is in that semi-ruinous state which I thought the result of an earthquake. I so expressed myself to the gentlemen of Cuenca one Sunday as we were walking. It seemed a good joke to them all. "No," they said, "it is not a ruin; that is the new cathedral."

The 'new cathedral' has been in the process of being built for the last fifty years. Covering what is approximately a full city block, it will, when completed, be one of the most magnificent cathedrals of Ecuador, if not of the South American continent.

The architecture, which is not Spanish but Gothic, has a massiveness of design which deeply impressed me. The walls were eight to ten feet thick, their dimensions dictated by necessity, for there is no wood except the eucalyptus to be had in the inter-Andean zone. The entire structure was of flat red brick and unpolished marble, with marble columns sweeping into modified Corinthian capitals of stone which were of such fine imagery and unison that I could not believe they were designed by a provincial Cuencano. For as long as the Latin Americans follow the simple massive style of the colonial Spanish

in bridge building or church, their architecture is interesting. Let them for a moment go off on their own and it is a hopeless pot-pourri. It did not surprise me, therefore, to learn that the original architect of the cathedral was a German monk who had been transferred by the superiors of his order to Ecuador. He had been the architect of his order in Germany, and once in Cuenca he satisfied his architectural ardour by designing this massive cathedral.

Immense and staggering when one considers the comparative poverty of a people, it is a building on entirely too great a scale for 35,000 people. Although outside of Cuenca it is not known, I must say that in all my travels in Latin America I found it the most finely conceived of any building erected since the colonial times.

The plans of the building, if any ever existed, have disappeared. The German monk in his long residence at Cuenca made a large-scale, wooden model. This is now below the belfry in the colonial cathedral on the plaza. The enormous task of raising the funds for the building did not seem to bother its visionary architect. It is being built under the same conditions as the famed cathedrals of Rheims and Cologne, which were conceived when their communities were small, and the time for execution long.

Whenever the money is available for further work the superintendent, a mere Cholo workman, repairs to the belfry and looks over the original model. When he thoroughly impresses on his mind the next detail he hurries back across the street and explains to his Indian and native workmen how the work shall be done. I know of nothing which explains the genius of this people more than this cathedral. Can one imagine our modern structures being erected without a single blueprint? Much of the success of the building is, of course, owed to the native masons. The descendants of the Inca races have inherited an innate ability to handle stone.

We have only to look to the great structures of the Incas in Peru to realize the mastery with which these people worked their materials, despite their imperfect bronze and stone chisels.

Isolated as Cuenca is, nevertheless it is the gateway to the Upper Amazon, a part which is known under the name of '*Oriente*,' the Spanish for east. Everything that lies in that mysterious Amazon forest is the *Oriente*, and is a part of the world the Highlander abhors, only entering it if the price for his services is so fantastically high that the dangers with which he had invested the jungles are thereby lessened.

We had come to Cuenca principally to enter the Upper Amazon region, to collect in the forests and to live with the famed Headhunters. The road from there to the *Oriente* leads over the Eastern range of the Andes and then splits into three distinct paths; one going to Mendez, one to Indanza, and the other to Gualaquiza. The roads and the small bridges that span the bottomless *quebradas* are the work of the Salesianos or the Francis de Sales padres whose main convent is in Cuenca. These Italian fathers knew almost everything there was to know about the eastern region, and, while we were getting our gear in order, arranging our food and methods of obtaining fresh supplies (for we expected to be there for six months), and the hiring of mules, we made friends with the genii of the Salesianos, Padre Albino del Curto and Padre Carlos Crespi, who had directed cutting the roads and building the bridges into the *Oriente*. Their energy was almost the only signpost of ambition in an ambitionless land. Even the technical school that the order was then building was the result of the efforts of Padre Crespi, who had tapped the resources of the richest man in Quito, a penurious Cholo, who had made a fortune out of Panama hats. He was wheedled out of enough money to build a four-story trade school and to put machinery into it to teach the youth of Cuenca something of the mechanical trades. The monks were fulfilling the State's obligation to provide training for

the young men of the country. In Ecuador the best education is still to be had from the monks of the religious orders, as one-sided and as lacking as even those primary instructions are.

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While restlessly waiting to arrange our trip we wandered all over Cuenca, trying to put our energy to some use. The weekly markets were our usual source of interest, but we came to note very soon, as one must, that everything in Cuenca centres on just one thing: the Panama hat. As it is such a part of their economy and life I thought I would allow my curiosity full reign—I followed the industry from beginning to end.

CHAPTER V

'PANAMA HATS ARE MADE IN ECUADOR'

CHRISTINE and I had soon noticed that at early dawn every Thursday the roads leading to Cuenca became alive with the natives of the region as they came to the Panama Hat Fair. From their corn-fields and hamlets far up the side of the Andes, from the townships of Azogues, Biblían, Cañar, and the remote sections of the Province, the Indian folk—Zaragúro, Cañar; Chola women, mestizo men—plod toward Cuenca.

The Cholos, garbed in their very best, walk quickly with a rapid movement of their hips inherited from their Indian days. Shod in leather pumps they avoid the puddles in the road and carry their contributions to the fair high on their persons. The pure Indians, packed down as usual, come heavily laden with earthen pots, alfalfa, and vegetables, but no matter what they carry, or how they are dressed, all bring a Panama hat.

Bearing little resemblance to the hat that we see in the shops, the crown appears to be square and about the edge is a long fringe of straw by which the weaver grasps the hat when carrying it. On all the roads leading to the city, commission agents have been stationed, anxious to buy the particular hats they want for that week's sales. Experts, they know at once by the straw and the technique where each hat comes from. Most of the Indians have compromised themselves, and shaking their heads to the offer of the *comisionista* they continue along the road that leads to the fair.

Cuenca is alive. On an ordinary day the town awakens slowly; Thursday is different. The vegetable markets

are in full swing as soon as the sun has tinged the white buildings to a roseate hue, and vendors are hawking their wares. The hum of conversation rising from the fair has a strident dissonance, for the sibilant Quechua tongue of the Indians is spoken in high-pitched tones.

Most of the thoroughfares are closed during the morning session of the Hat Fair. The town has grown until it has three times the normal population, for not less than 25,000 Panama hats are purchased each week at the fair. Such a volume of trade made me inquire just what percentage of Panama hats is produced by Cuenca and its environs. I was startled when I learned that more than eighty-five per cent of all the Panama hats of the world are made here in the province of Azuay and over half of them in the town of Cuenca. If I had been looking for the source of the Panama hat (which most of us associate with torrid weather), I would hardly have expected to find it in a region 8500 feet above sea-level in the temperate, and often frigid Andes ! The straw, the Toquilla fibre of which the hats are made, does not grow there to be sure, but must be brought up miles from the dry littoral of Ecuador.

Then why 'Panama' hat ? Simply because the Canal Zone was the first and original point of distribution, a name which will never be lost, since time now has honoured the association of ideas, Panama and hat. The same thing is true of the white ant, which is neither white nor an ant, and of the American indigenes, called 'Indians,' when they are not from India.

In point of fact, Panama never has produced the so-called Panama hat. The art is confined wholly to Ecuador, with the two minor exceptions of a section of Colombia, near the Ecuadorian border, and a still smaller section in Peru. In vain has Ecuador protested against this miscarriage of the publicity that should rightfully be hers. The Ecuadorian Consul of San Francisco decided to combat it alone. He printed stickers attached to all his letters reading : 'PANAMA HATS ARE MADE IN ECUADOR.' His contra-propaganda failed, for people

remarked: ‘ I see they are now making Panama hats in Ecuador.’

The weaving of hats is as old in Ecuador as its civilization. As the Cañar Indian and Quito folk made gigantic felt hats from the wool of the llama, so the tribesman of the coast, living in the hot littoral of Manavi, chose to protect himself with a hat made for the climate. Although Xipixapa and Monticristi are the original homes of the hat (having had centuries of experience they produce the finest) the bulk of the production is reserved for Cuenca and its environs.

The palm from which the Toquilla straw comes is a small, stemless species, six to fourteen feet high, with plait-like fan leaves about four feet in diameter, having the characteristically deep indentations of the family *Cyclanthaceae* to which it belongs. To the native on the coast it is *paia toquilla*, and the *costeños* have developed a very lucrative trade in its exploitation. Plantations are devoted to its growth. The large green leaf is cut from the base of the palm stripped of its outer filaments, thrown into boiling water, constantly immersed, and then set out to bleach in the equatorial sun. In a few days the straw is cut into small strands that shrivel with the drying to small compact cylindrical forms, cord-like in texture and over a yard in length.

It is important in the cutting of the leaf that it be nipped in the bud, so to speak. Left to itself, the large leaf unfolds like a cabbage, rising from the central shoots of the stalk, but it must be cut before this happens. The green leaves are cut with a comb-shaped knife; the texture depends on the degree of fineness wanted in the make of the Panama hat. For the more expensive hat the straw must be delicate and long.

From the coast come the hundred dollar Panama hats which most people gape at, but do not buy. If the weaver is at work on a fine hat he will usually work in the cool of the night, or if he is working during the day he will keep a bowl of water close by, to moisten the straw constantly, so that it will not become brittle and break.

This is the source of the legend about underwater weaving.

On the hat that brings one hundred dollars, the weaver will work six months and make from 150 to 300 sucres. This will not be six months continuous work, for the Panama hat is a cottage industry based on the part-time principle. The weaving of the finer hats is usually confined to certain families whose speciality it is and by whose dexterous fingers is produced a weave as fine as linen.

How did the Panama hat come to Cuenca? I can only hazard a guess, for no one exactly knows. Since there had been perpetual enmity between the coastal section and the highlands, a group of soldiers from Manavi on the Ecuadorian littoral were stationed in the highlands to lessen their desire to revolt. While there they acquired wives from the Indians, and imported their ancient art of weaving into the garrisons. At any time of the day the soldiers on duty or off began to weave. The finished hats were purchased from them and sold; the Indians about Cuenca saw the profits to be derived, and within a few decades the industry had flowered into a thriving business. Now, within a radius of forty miles, there are over 200,000 weavers. Children, adults, Indians, mestizos, and those of pure Spanish blood, resort to it at odd moments of the day. The clerk in the store will lay down his weaving to attend to you, then pick it up when you have left his store. Women sit in the doorways and chat as they dextrously flip the straws into the weave that is so characteristic of the Panama hat.

The hat industry is a cottage craft, guided by the hand of 'big business.' There are no factories. The Indian and Cholo weavers have worked out a very interesting compromise with the demands of business and the demand for mass production. It is one of the few, I am almost tempted to say, the only cottage industry worked on a vast scale that answers, quickly, the demands for new styles. How does this system work, from designer in New York or Paris, through importer, commission

agent to weaver? Nothing, seemingly, could be harder to control in the vastness of Cuenca, Cañar and Azogues than the stolid Indian whose phlegmatic attitude has been the despair of sociologists.

For convenience, I will create a typical situation. Lilly Dache, a Parisian designer living in New York, designs for the coming summer a Panama hat, whose brim and crown are to be of certain dimensions. The hat is to be blocked in the manner that she ordains; that part will be done in New York. Contact is made with, let us say, the Ecuadorian Panama Hat Company of New York. A code message is sent over the cables and reaches in short order its representative in Cuenca, Mr. Stanley Brandon. His commission agents, Spaniards and mestizos of Cuenca, are advised some days preceding the Hat Fair. The agents in their spare time take their rulers and break off pieces of straw which represent the desired size of crown and the brim of the special type of hat. These agents assemble in their usual buying place on Fair day.

I purposely followed an Indian on the road to Cuenca to find out exactly what happens to the Panama hat from the time it is woven. He moves along toward the commission agents who are stationed on one of the principal streets leading to the general market. A stack of hats, square crowned, with the overhanging straw fringe, are already piled before them, one on top the other. My Indian waits his turn as a Chola woman offers her hat to the *comisionista*. The man picks up the hat, measuring the crown and the brim with a small rule he holds in his hand. He inspects the fibres, looks inside the hat and makes an offer. The Chola woman refuses the proffered price and asks a higher one. The agent lowers that by a few *reales*. Each in advance, agent and weaver, knows the price that will be paid. Custom determines the procedure: the weaver demanding twice the price he will eventually receive. Good-naturedly the harangue continues until they reach the price that each expected in the first place. The agent

pays the weaver in cash and marks the price he has paid in the hat, and it follows the others to the pile beside him.

The Indian that I had followed evidently had a finer hat. He refused the proffered four sucres and the agent, knowing that it is a superiorly woven hat, raises the price two *reales*, but still my Indian was not satisfied. He trotted off to another *comisionista*, where quickly they reach terms, for this agent, having an order to buy up the finer 'straws,' purchases it for six sucres. The agent who had purchased it took my Indian aside and gave him a piece of straw, explained in Quechua the type of hat that Lilly Dache wanted. Since the Indian cannot read or write, written figures do not mean anything. The crown represented by one straw is to be so high, the brim represented by another is to be so wide. "Did he understand?"

"Yes," the Indian nodded slowly up and down. "He understands."

The texture is to be of such and such fineness and Mr. Brandon would pay eight sucres. And would the Indian be sure and keep his hands clean? and not weave with dirty hands, the dirt and perspiration colour the *paja* and it will not bleach out.

Again my Indian nodded his head; he then repeated, holding up the shorter straw, "For the crown." The agent nods. He held up the longer piece, "For the brim." The agent nods. And to confirm it all, the Indian reiterates. "Eight sucres."

"Como no," said the agent.

My Indian trots off to the market to buy his *paja* (straw). The agent, meanwhile, was interviewing all the weavers whose work he knew. This is a special order, the price is more than for the usual hat, and only the weaver whose work is of machine-like consistency can be relied upon. Ordinarily the weavers do not like the special orders, nor do they like to weave American women's hats. I heard one woman remark that it is obvious that the women of the North must be of a flighty mind. One year they want one type of hat, the next

year another. They never seem to know what they want. Fashion is unknown to the mountain Indians. They have been wearing the same style of clothes for ten centuries.

Meanwhile, my Indian was in the plaza buying his *paja* for the next week's hat. In an immense square, with the natives selling their food stuffs in the centre, row after row of Indian women are sitting on small woven *petates* behind their products. Gleaming whitely in the rising sun are the Panama hats. The little children, the women, the men, all wear the same type of hat. In one corner of the plaza are seated the vendors of the *paja*.

The straw is tied into bundles of ten strands, this being enough to make the ordinary hat. My Indian moved from bundle to bundle, examining, twisting the fibres, breaking off a small piece to see if it were brittle; for that is important. If the *paja* breaks while he is weaving a knot must be made which is in a sense disfiguring to the hat, and the commission agent will use it next week as pretext for paying a lower price.

Finally he made his purchase, paid the forty centavos for the straw and sauntered off toward the *cantina*.

By Friday morning the Indian has slept off his debauch of the previous night. Through it all he has been careful not to soil the straw, and although he may be brought home staggering, his subconscious mind has remembered to carry the *paja* carefully wrapped. By the time I see the new hat part of the top circle of the crown is completed. All the straw that will form it is laid down, so to speak, in the traditional warp and woof of any weaving. The weaving is held on the lap. With a twisting of the fingers each fibre is woven and pulled tightly to form a concentric pattern. So quickly and unconsciously does he work, that if I ask him to go more slowly that I may see the technique, he falters, and explains. "Slowly, I cannot do it." Wherewith, he is off again, fingers flying, twisting, pulling, and the crown taking form. In his spare time from planting his corn, harvesting, and shelling beans during the next few days,

the hat crown is finished. He carefully measures it at several angles with the piece of straw given him by the agent. By Wednesday the hat is finished, and once more on Thursday he is off to the market.

For this order the agent is more exacting; he takes the hat from our weaver and with a small rule which he keeps in his pocket for the purpose goes over the whole crown and brim, making sure that the crown is even all about. He examines the inside, complains about the dirty marks.

The Indian protests that he was harvesting his corn and could not be expected to keep his hands clean.

When, after the Fair, the hats are brought to the office of the exporter, a corps of technicians carry them into their final stage. The hats are trimmed, the edges bound, and they now bear some resemblance to the finished product, but they have a grey appearance. Next they are sent to the bleaching rooms, where they are placed on small racks very much resembling a coat hanger. Underneath, sulphur is placed on small braziers, the fumes from which bleach the hat. Here the famed volcanoes of Ecuador come in handy, for Ecuador has sixteen snow-covered extinct and active volcanoes and the Panama hat industry consumes one thousand tons of sulphur yearly.

To finish the bleaching and give the hat that perfected whiteness which we know it to have it is given a bath in the milk of sulphur. It is lavishly painted, then the operator rubs the sulphur into the hat by whirling it in his hands and working the *leche*, or milk, into the fibres. The hats are next given a final drying and bleaching by laying them out in the sun.

They are then put on to hat blocks and pounded by a man with a large wooden mallet to smooth out all the imperfections of the weaving, such as small knots which the weavers have made when the straw is broken, and other small imperfections. No Panama hat may be said to be well woven when these are apparent.

Finally it is pressed with a charcoal-heated iron,



A CHOLO WEAVER BRINGS HIS WEEKLY CONTRIBUTION TO THE PANAMA HAT FAIR



THE PANAMA HAT WEAVERS STAGE A FIESTA

leaned with starch for spots which have not come out in the bleaching. Folded into the half-moon shape in which one buys them at the store, the Panama hat is ready for shipment.

Although over one-eighth of the Republic's population is engaged in the business, the hat industry provides only one-sixteenth of the total of her exports.

From the sociological point of view, however, the Panama hat industry has had a definite ameliorating effect on the Indian. In the provinces of Cañar and Azuay, the centre of the industry, the Indians own their own pieces of land and their homes ; they cultivate many of their own necessities, are unusually clean for mountain Indians and quite independent. This is not true of the Indian in the north of the Ecuadorian Republic, who is bound by the debt-system to some large *hacienda*, and whose life is relatively primitive compared to that of the prosperous hat weaver of Cuenca.

I did not learn all of this at one Panama Hat Fair. As we stayed over three weeks in Cuenca I had ample opportunity to see not only the Fairs, but to learn much by questioning the foreign buyers living in Cuenca. I came upon Mr. French, the English hat buyer, one afternoon after a Hat Fair, preparing to send off a shipment to Guayaquil.

" Doctor, I say, do you want to see the way we send off the hats ? " A tall slow-speaking Englishman, dressed in tweeds, stood by three squat natives who were loading an obstreperous mule with the bundles of hats.

" Do you send them off this way, Mr. French ? Won't the hats get rained on and crushed ? "

" Not a bit of it, " he answered, lifting a part of the flap of the covering to show me. " You see these are all bound in burlap and underneath it there are rubber ponchos . . . they can't get dirty and can't get wet. Of course, sometimes the mule rolls down the mountain-side, but that does not happen often. The *arrieros*, the muleteers, are pretty careful, you know. You asked how

they get to Guayaquil. Do you know the town of Babahoyo on the Rio Guayas? Well, this man takes them down there, and from that point we send them down on boats. Much cheaper and certainly much more sure of getting there than sending them by railroad. Not that I," and his voice was deeply ironical, "would say anything about the G and Q railroad, a fine piece of mechanism as long as it is running—but that isn't often."

He turned his attention to the muleteers. The mule's head was covered with a sack. The men tugged at the ropes stretching them tightly over the mound of burlap-bound packages. French gave the sacks a reassuring slap on the top, pulled the ropes to see if they were tight, nodded his head to the muleteer who held the animal and the small caravan started off.

French watched them for a moment and said :

"You know, you can't trust a soul in this business ; it really is a very personal one ; I have been here four years now and every muleload of hats that goes off, I see to their loading. The moment you neglect this, you might lose your profits for some months."

We were wandering through his rooms downstairs where the native employees were at work in sorting, labelling and inspecting the hats.

"This is as far as we go with a factory. You've heard, undoubtedly, the trouble one man had trying to make the Indians weave hats in a factory. They just wouldn't do it. It is a native industry just as we make our tweeds in Scotland, and it won't work any other way."

My attention was drawn to a whole stack of white, wide-brimmed Panamas on the table.

"Where are these going? They look wide-brimmed enough for Texas rangers."

"Those," he answered, "are for Cuban tobacco planters. Beneath the sun, in the unsheltered fields in Cuba, most of the planters go in for wide brims. This," and he held up another hat, "is called 'Parejos,' you know—'equals.' We call them that because the height

the brim and the crown are the same. Those we send to England. The ones to America are called ‘ Castores ’—why?—I can’t tell you.”

“ And what is this little ridiculous thing ? ” I asked, picking up a hat with a tall crown and an extremely narrow brim.

“ That,” said French laughing, “ we call our *Ratonera*,’ in other words, a mouse-trap. They go to Quito where the dandies like them. No self-respecting Anglo-Saxon would be caught dead wearing the thing. As a matter of fact, we have quite a few shapes and sizes for all parts of the world. You see, I do the buying for all the British Empire, and we have all sorts of styles—from India to Africa.”

The afternoon *paramos* rolled down the valley and gusts of Andean fog crept into the room. I shivered noticeably. French turned to me and asked : “ What about a spot of tea ? Warms you up on this cold day. I suppose Mrs. French has a fire going too. All my Quenca friends wondered just what I would do with a fireplace, and I had an awful time building it. But it works well and most of my friends like it enough, but they will not build one. Suspicious, you know.”

We climbed the stairs to his apartments which were above his place of business.

“ Suspicious ? ” I echoed. “ About what ? ”

“ Perhaps I used the wrong word. I should have said they are determined not to change their manner of living and are suspicious of change. They think if they go into a warm room and then go out in the night air they will die . . . well, here we are. ‘ Pase Usted,’ ” he mimicked the Ecuadorian mannerism and held open a door that lead into his library.

A cheerful fire played in the fireplace—the only artificial heating system in all Ecuador south of Riobamba. Mrs. French, a young Scotch woman from Edinburgh, who had only recently come as a bride to Ecuador, entered with a tray of tea and biscuits. I stood with my back to the fire. It was the first time that I had been

really warm in weeks, and I thought of Christine, who this moment must be freezing in our rooms at the hotel, where there never is heat of any kind.

"When do you intend to get off for the Oriente?" asked Mrs. French. "I hear you are having a perfectly awful time in getting *arrieros*."

"I think we shall be off in about two weeks. Meanwhile I hope to see more of the country about here. I have already done considerable collecting, but there is so much to see that I am distracted from my work. I do hope to get off soon."

"Oh, I meant to tell you about the ruins that you asked about," interpolated Mr. French. "I found a native who knows about them. He says that he can lead us to them. They are near Cañar, about fifty miles north from here; you probably passed through Cañar at night? Well, anyway, he knows where they are, and says that Ingapirca is still intact."

"I am quite surprised, French," I said, "that no one knew of the ruins. Before I came to Ecuador I read as much about the country as possible, which is not a great deal, and I think it was in a book written by an Englishman named 'Enoch' that I read about them."

"Well," confirmed French, "I never heard of them until you spoke of them. I should like very much to visit them with you when you return from snaring your condors. By the way, I have the muleteer all ready for your trip to the *paramos*. I have never been to Chan-Chan, myself, but I know that it is where other naturalists have gone in the past to look for condors. You have to ride about two days, half-way between Cuenca and Loja, which is the most southern town of Ecuador, about one hundred miles from here. It's a long ride and a tough one across those *paramos*. You must be profoundly interested in natural history to take that jaunt just to look at condors. Your wife goes with you? Well, we wish you luck . . . you get the condors and then when you come back, we will have our little expedition to the ruins."

CHAPTER VI

THE SCAVENGER OF THE ANDES

THE majestic condors hold court on a very level plain, 14,000 feet above the sea, at Chan-Chan *paramos*, on the road to Loja. To reach it we rode for two days over yawning *quebradas* and high peaks, occasionally fording rivers that, from the heights, have the appearance of being necklaces of green in the desert landscape.

Having once left the valley of the Rio Jubones, a large river that flows into the Bay of Guayaquil, we began our long climb to the Arctic-like regions. From a slight incline the road began to rise at an angle of sixty degrees, zigzagging back and forth until my aneroid showed that we had climbed at the rate of a thousand feet an hour. At noon the first day we reached the beginning of the *paramos*. The vegetation was cut off as if it had been levelled with a giant scythe. It was one of the few times that we had crossed these equatorial 'tundras' when the sun was shining, and it gave us some time to observe the plants of the region.

Like the northern wastes, the *paramo* is devoid of extensive arborescent vegetation; the trees are all dwarfed, twisted, and turned by the wind, until they remind one of oaks which some highly mischievous genii has metamorphosed. There, too, are short-stemmed, brilliantly flowered Compositae, which Christine wished to collect. Nearby these were the usual mosses and lichens finding shelter behind some knoll. And behold! On the brightest of the flowers was a humming-bird. Its long beak was seeking nutriment from these frigid blooms of the heights. Here

we have the utmost in contrasts ; the dainty, fragile, minuscule humming-bird, one of the smallest of the avifauna, companion in this Andean Olympus to the condor, the greatest of flying creatures.

While Christine collected the plants of the *paramos*, I scrambled with our servant, over the rolling plain to look for *paramos* mammals. With my glasses I swept the horizon. Save for some llamas feeding in the distance, I could see little life in these rolling moorlands.

There are, however, several interesting mammals found in the *paramos*. The hairy tapir lives as high as 10,000 feet and is a relative of the tapir confined to the hotlands. When I first saw a skin of this animal, I could not believe it was a tapir, for I am accustomed to think of it as a sleek-skinned animal that wanders in the jungles. This skin that I saw had black hair as long as that of our black bear of the States, and this species is confined, so far as I know, to the Ecuadorian and Colombian *paramos*. A deer, short-legged with heavy body, related to the Virginian deer, is occasionally shot about here. There are also an Andean coyote and a spectacled bear. Later, I was to obtain one of these little bears which has a fawn-coloured mark above and near the eyes, from which its name, 'spectacled,' comes.

At two in the afternoon the wind descended on us. The mules, which were tied to the largest of the gnarled trees, turned their heads anxiously, and their nostrils dilated in rapid pulsations, as the wind gathered momentum. These animals fear the wind and with reason. They sometimes become footsore in crossing the Andean prairies and their owners are forced to turn them loose, where they often die of cold.

As we rode along enfolded in our great woollen ponchos, we raised our heads to watch the sinking sun. In silhouette, against the moving orb, were two objects, volplaning in the cloudless sky. These were the specimens for which we took this long trek—giant condors, the greatest of flying creatures.

As we watched these vultures gliding into the setting

sun our beasts moved toward a rise in the *paramos*, We were greatly surprised when this 'rise' turned out to be a small adobe hut with a roof of thatched ichu grass. Had we been alone we should have gone right past it. So well did the dwelling mimic the surrounding country that we would not have taken it for a habitation made by the hand of man.

From within came a voice bidding us welcome, and as we stiffly dismounted, a little, wrinkled old man, looking for all the world like the Inca himself, came out of the house, doffed his hat in deference to my wife, and making a slight bow, bade 'Sus Mercedes' (your excellencies) welcome to his humble dwelling.

The interior of the house was about six feet square, with a small adjoining hovel which might have been called the kitchen. The owner had no neighbour in fifty miles. Alone with two sheep, three worn-out, miserable horses, one ancient rooster and a patch of potatoes, this descendant of the Incas ruled the *paramos* near the top of the world.

There is no twilight near the Equator and with the last rays of the sun came the bitterly cold night. Through the great gap in the thatched roof, one could see the Southern Cross shining in the crystal clearness of the Andean night.

In the light of a cheerful fire that burned with some difficulty at this altitude, we made our inquiries about condors.

"Condors? Si, si, señor, hay muchos aqui" ("there are many here".)

And he told us that he had a horse so old it could no longer be brought to the house and that the condors, sensing that it would soon die, kept circling about it every day. They had been doing this for the last week. *Mañana*, we could see for ourselves.

"On the morrow" we followed the old man over the *paramos* up to a rocky portion above the level plain. There was the horse, so old we could see the ribs through the skin, the pelvis was so devoid of meat, it looked as

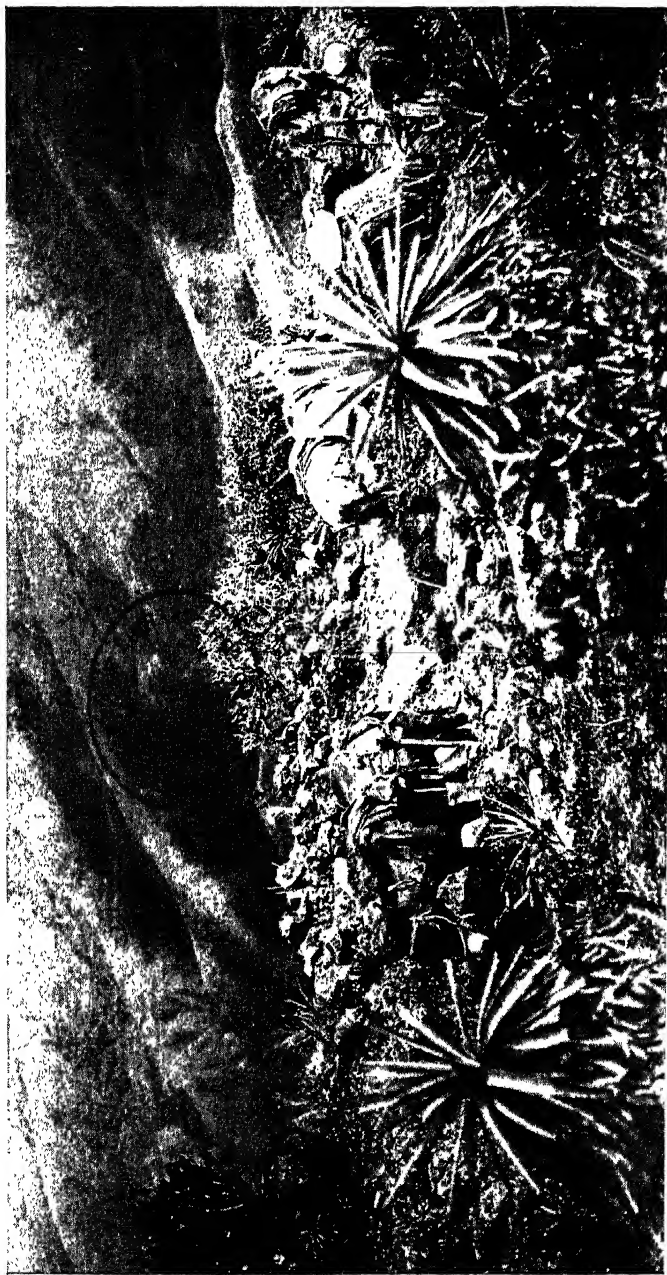
if it were merely covered with a thin hide. High up in the heavens three condors moved in effortless flight.

We tied a halter about the horse's neck and the old man pulled and we pushed, but the animal resisted with a tenacity one would think impossible in a steed of bones and hide. The greater part of the day was spent getting him to the level ground where we could trap the condors. The effort of moving was too much and the horse collapsed, his legs being too feeble to support him.

We then retired to the hut to make ready for the next day. One of the *arrieros* had tended cattle in the *paramos* of Cañar and knew how to handle a lariat, so that the rest of the day was spent making ready a number of these lassos. In the interim, we bargained for the horse with our host.

As a general rule these people will not kill an animal prematurely, even though death will relieve it of its sufferings. The animal must die of its own accord. This horse had reached a state of weakness where it could no longer endure the cold of the Andean night, as the owner clearly enough realized. We had some little difficulty in the negotiations, for our host wished to charge us a price for which we could have bought a thoroughbred at Epsom Downs. We finally settled on five sucres for the animal. I gave the owner my pistol and told him where to shoot the animal. A few minutes later the air was rent with an explosion, the echo of which was batted back and forth by the Cordilleras. To-morrow our condor hunt would begin.

The condor has a very prominent part in the ornitho-mythology, with which the annals of natural history are filled. True, it is the greatest of living birds, but few specimens that I have seen ever exceeded ten feet in wing spread. They do not carry off children nor living animals, for the very reason of the weakness of their talons and because the structure of the claws is not made for grasping. It was known to the Incas as *cuntur*, from which our modern word condor is derived. This root, *cuntur*, appears in the names of some of the illustrious



WE MADE OUR WAY UP THE PRECIPITOUS SLOPES OF THE ANDES TO
REACH THE *PARAMOS*



THE MAJESTIC CONDOR AFTER ITS CAPTURE

in the time of the Incas—names which have persisted down to modern times. The family, *apu-cuntur*, the great-condor, *cuntur-caqui*, condor-by-excellency, are but a few.

With the puma, the condor was the symbol of the Inca's most trusted caciques and was an object of sacred worship to the Children of the Sun. The Incas could well appreciate a creature, which in one rapid swoop could traverse the entire distance from Cordillera to seashore in a fraction of the time it took their best runners to make it in relays. And although we might be inclined to regard a scavenger as not a fit bird for worship, the condor has, like the rest of the vultures, an important place in animal economy for it consumes decayed bodies which are commonly designated in polite language as 'high.'

The worship of the condor is undoubtedly like the worship of all animals, a mere phase of religious experience, through which all people pass. The Incas who struggled against every element and obstacle of a region that one would have thought incapable of supporting a civilization, looked with awe on a creature so well endowed for preservation in these Arctic regions of the *paramos*.

The condor builds no nest, but lays its two eggs on the jutting crag of some precipice and fiercely defends them. It has not the kingly port of an eagle, but the cowardly mein of a vulture and travels, not in pairs, but usually in some numbers. But the most amazing things about them, as Humboldt remarked, is a remarkable phenomena: the same bird which can fly for hours in regions of an atmosphere so rarefied as that of the high Andes, can sometimes descend to the seashore on the Pacific where it has been seen feeding on dead whales, passing through all gradations of climate in a few hours. Its range is from the high mountains of Darien to Tierra del Fuego where Darwin speaks of having shot them. At a moment of caprice it can quit the Andes at 16,000 feet and shoot down into the lower slopes of the Western Andes on the Upper Amazon.

We eagerly arose to watch them come down to the

feast and to study the best way to capture them. There are three known methods : one is to build a strong, open, latticed square ten feet in height, fifteen feet square and within place a carcass of some large animal. The condor drops in to eat, but cannot always get out, as it needs a 'run-off.' Or one can lay open lariats on the ground near where the condors are feeding, the loop kept open by small pegs ; but this is not too practical, for the condors will pick at the rope thinking it at first to be long intestines, and, of course, will spoil the circle. Neither of these methods is too successful. The best method and the one which we decided first to try, is the classic method of condor capture. The carcass of the dead animal is placed preferably about thirty yards from some large concealment where mounted horsemen are stationed with lariats made ready. This must be on a level pampa. Then with a burst of speed, the horsemen ride in to the condors gathered about the cadaver, and capture them with the lariats—maybe. The point in the technique is to allow the condor to feed and feed until it is satiated, when its movements are considerably inhibited.

The condors had undoubtedly sighted the horse when we moved it, for when we arrived at the carcass in the morning they were already at work on the dead beast. There were four vultures looking like gigantic roosters with brilliant red combs and white Renaissance ruffs about the necks. They must have been about four and a half feet from tail to beak and stood about thirty-six inches high. One condor was picking at the entrails of the cadaver, for this is the universal mode of entry into the carrion. The great creatures seemed not at all greedy. One was busily at work and when it relaxed for a moment another would hobble over and proceed with the task of opening the animal. I wanted to take pictures of them, but I did not care to reveal ourselves prematurely. Any photographic plans that I had came abruptly to an end anyway when the midday fog of the *paramos* came rolling in and blotted out the birds from our sight.

Next morning the carcass had been well eaten into ; and now there were eight condors, each as large as the other. Several were partially lost to view as they stuck their long necks and part of their bodies within the half-empty carcass. Others lazily chaffed each other when they touched ; still others stood motionlessly aloof near the animal. A riderless horse running toward them disturbed the great birds ; they waited, half-expectantly, as the horse came near them and then they deliberately began to walk away, heads erect. When the horse was within twenty yards of the carcass the condors 'took off.'

They stood for a moment as if to sense the general direction of the wind, lowering their necks until these were parallel with their bodies, and then ran into the wind. Their gait was a clumsy running hop, so common to all vultures, with the wing-tips of those great wings thumping along the ground. After they gained considerable momentum the wings were unfurled ; putting on an additional burst of speed, they gave two or three hops and three strokes of their powerful wings and left the ground. A few more strokes of the wings and they were into the air-currents. There was now no moving of the wings. Some condors coming about swept close to us, giving us a keen survey. The tail and wings moved with the precision of the rudder of an airplane and we could almost anticipate the bird's movement ; the sudden drop of the tail meant that it would shoot heavenward. Here then, were the first principles of the airplane, as nature conceived it thousands of years before the idea took definite form in man's mind.

In the afternoon the sun broke lazily through the fogs that veiled it, and I crept forward to get a picture of the condors standing in pairs with wings outstretched, a stance common to them whenever the sun shines. As soon as I had taken the picture, I gave the signal and the two mounted *arrieros* suddenly emerged from behind their hiding place. The condors were now so surfeited with the horse meat that some of them merely eyed with

disdain the oncoming horsemen. Some of the birds lowered their wings. One condor, with its neck far into the empty head of the carcass, brought its head out at the first noise of the hoof-beats and deliberately put it in again to continue to eat. When the *arrieros* were within a few yards the condors suddenly realized their danger and moved off fast enough.

But checked somewhat by the amount of food they had eaten within twenty-four hours they needed at least ten yards of running to get their weight off the *paramos* floor. José, the first *arriero*, threw his lariat and it went around the nearest condor, but failing to pull quickly enough, it slipped from the neck and the body and tangled about the legs. In the very act of springing into the air, the condor suddenly collapsed in what an aviator appropriately calls a 'nose dive.' It recovered and stood facing José as he dismounted and walked to the condor, gathering in the slack of the lariat.

Meanwhile the other *arriero* was not succeeding as well. He set out after the condor that had had its head within the carcass. It was a younger bird than the other, and for some reason it did not elect to take flight, but ran ahead, until the boy threw his lariat, which struck it harmlessly on its head. Then it sprang into the air and suddenly turned and swept back to the carcass, in spite of the fact that we stood close by, holding on to the other condor. But it was doomed; for the rider coming about bore down so quickly that the bird had not sufficient time to take flight before the lasso was passed over its long neck. Despite the lariat it took flight and began to rise, five feet—ten feet—into the air. The *arriero* quickly dismounted and held firmly to the rope. It was a curious sight, and we breathlessly waited for the coming struggle. Both bird and man tumbled almost at the precise moment when the condor reached the end of the slack of the rope. It tried to rise again, but before it could do so some of us pounced on the rope and the second condor also was ours.

It was no little task to make crates in which to put our

two condors, but with the help of our Indian, who lorded over these Olympian heights, we found enough material to make crude cages that would last until we retraced our steps to Cuenca.

"Would you like to sell us another horse?" I asked the Indian. "I might want to feed the condors."

"Feed them?" inquired the Indian. "They do not need food, they can go months without food. Besides my horses are far away and maybe, if my son does not soon come with the chickens he promised to bring, it will be that I shall have to eat my own horse."

"And how much do I owe you for your kindness?" I asked our host.

"De Usted gusta, Su Mercedes." ("Whatever it pleases you to give, Your Excellency.") I put some sucres into his hands.

"Muchas gracias, muchas gracias, Su Merced—you are very kind," and he bowed his head and doffed his hat in fine obeisance. "Viaje bien, Señores. Get the birds alive to Cuenca and come back soon again to see Juancito."

The return was fraught with difficulties, for the cages did not withstand very well the buffeting of the mules. However, the birds arrived in good shape at Cuenca. There I made arrangements promptly to send them off to the Zoo at Memphis, Tennessee, where they arrived well, and I understand they still thrive.

CHAPTER VII

THE RUINS OF INGAPIRCA

WE thought we would ride with the birds as far as Cañar, where they could be transferred to another automobile that would bring them to the Tambo depot, hence travel by train to Guayaquil where I had wired instructions for their shipment to the States. We hired a truck, put the birds behind and Mr. French, Christine, and I crowded into the front seat and bounced off to Cañar to complete our plans for the visit to the ruins of Ingapirca.

Cañar, a three hour drive north from Cuenca, lies at a higher altitude. As usual the town is built about an enormous plaza, dominated at one end by a great church and convent. Contrary to Cuenca, Cañar is not prosperous; the pure Cañar Indian is dominant, the Cholo middle-class is absent, industries are few.

From Cañar we took horse, and as we rode from the town into the open country we could see the mists of the morning still rising from the *nudos* of Azuay; the lofty *paramos* were clearly visible. We passed fields purple with the blossoms of the tuber which has so changed the world's diet, for it was the harvest time of the potato. Corn and potatoes were the only crops in evidence. In the distance, to the music of their pipes of Pan, the communal harvest of the Incas was being launched by the Cañaris.

The roads were dotted with Indians, hurrying along in their half-trot, half-walk; the men in llama chaps and felt hats trotted beside their women folk scarcely distinguishable from the men. All were bare of foot, hardened to walking over the frigid earth. On the backs

f the women were strapped the inevitable babies. As we rode by the Indians doffed their hats in deferential greeting.

Our mounts were thin, emaciated beasts, but though we were climbing to 11,000 feet, the horses set a pace which we would have thought impossible at this altitude and in this rare atmosphere.

A two hours' ride brought us to the ruins of Ingapirca. It tops the end of a mountain spur that extends from the high Azuay *nudo* which forms the southern part of the Cañar *boya*. The fortress dominates the surrounding country; not only is the whole *paramos* to be seen from it, but all the valleys below. The fortress of Ingapirca is in a splendid state of preservation; in fact, it is the only Inca structure still to be seen in all Ecuador. The part which remains is oval-shaped and about fifteen feet high and one hundred and fifty yards long through its great axis. It exhibits the beautiful stone work of Inca architecture in its last period. About the ruins are the remains of a wall which once covered a great area. These were the barracks for the soldiers during the conquest of Quito. A ground plan of the ruin was made by the Spanish explorers, Juan and Ulloa in the eighteenth century. Their drawing displays such exactitude of measurement that it must be considered dependable, even though the rooms of stone and the immense wall surrounding the ruins have now disappeared. Possibly the rooms and walls have been covered, or the stones forming them have been carried away. The most striking part of the ruin is the oval building and the adobe structure that is on the tower. This is commonly supposed to have been the private residence of Huayna Capac, the Inca.

The stone of which Ingapirca is fashioned, as well as other buildings in the region of Cañar, is porphyritic rock, enclosing crystals of feldspar, quartz, and the like. Since this same rock is characteristic of the regions about Cañar we can dismiss as legendary the tale that the stones forming part of the citadel of Ingapirca were brought

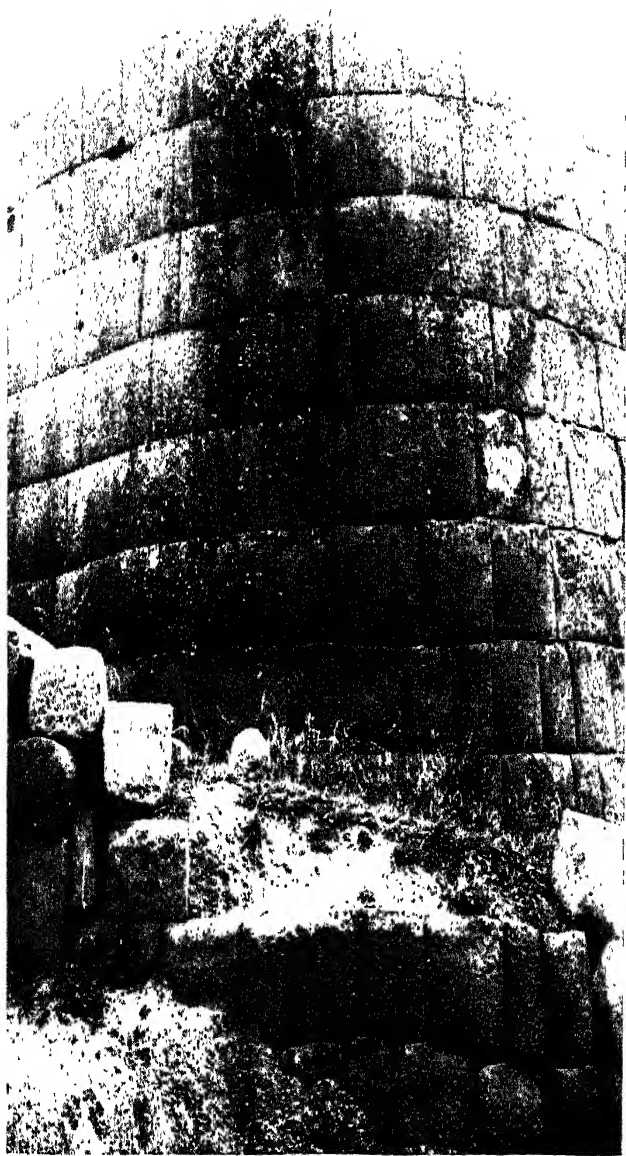
from Cuzco, a thousand miles away. This native stone gave the Incas a material that answered the three requirements of their architecture ; simplicity, symmetry, and solidity.

In 1808, the time of Alexander von Humboldt's visit to Ingapirca, the superstructure of adobe was still intact and he has left us a sketch of it. To-day, only a portion of the ruins remain, but the peculiarly inclined door-posts and characteristic niches are still in a good state of preservation.

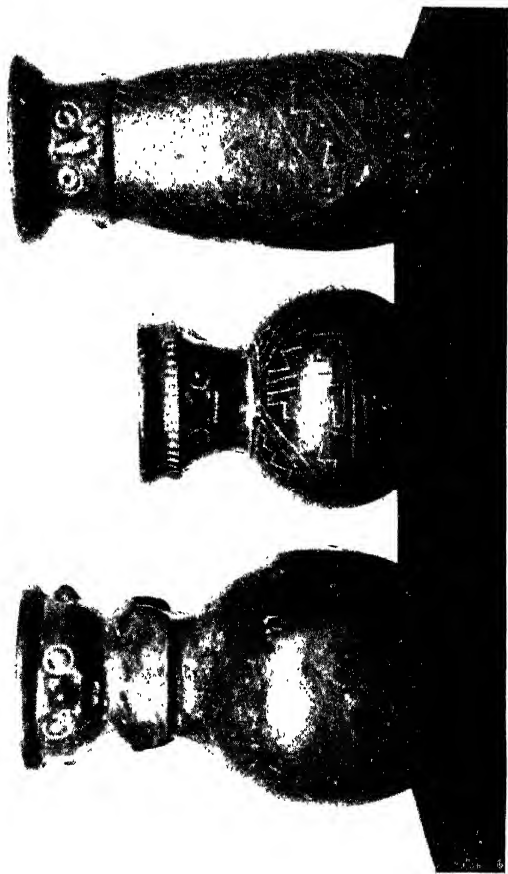
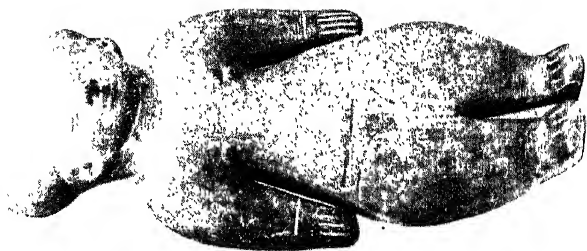
Ingapirca is not formed of such colossal units as are found in the fortress of Sacscahuman in Peru, but it is none the less one of the architectural triumphs, and the latest, of the Incas, for it was erected somewhere between 1450 and 1485, the interval when the Incas were conquering the Quitus Indians of Ecuador.

One side of the ruins leads down a precipice to the valley of the small Rio Gulan. The side of the precipice is buttressed with rocks to keep the superstructure from falling into the valley below. That the engineering was well done is witnessed by the fact that after five hundred years of neglect the ruins still stand. The old drawings made by the early explorers picture the ruins as a fortress, surrounded by a moat or a river on all sides. This is imaginary, for there is only one river far below in the valley commanded by the fortress. The strength of the citadel lay, not so much in its fortifications, as in its position from which any massed movement would be discerned. I cannot subscribe to the general conclusion that it was either a solar observatory, a temple, or a citadel, for the vestal virgins of the Inca. The excavations made many centuries ago explain it well enough. For the rooms are divided like those of Tumipampa, in barrack-like sections. One can readily infer that a country so unsettled as Cañar and its environs had at the time more need of fortress and barracks than a temple for vestal virgins.

By following the rim of the spur behind the ruin, we could see the strategic position that the fortress occupied.



THE CIRCULAR END WALL OF THE RUINS OF INGAPIRCA



ARCHAEOLOGY OF ECUADOR

(*Left*) Anthropomorphic drinking cups from Ingapirca.
(*Right*) Large clay doll from the coast of Ecuador.

Continuing about the edge of a perilous path, we were brought by the natives to a seat cut in stone. It is called the *Inca Chingana*, or the sport of the Inca. I could see nothing of the sport for which it might have been constructed. Carved out of the porphyry of the Cordilleras, it is six feet long by three in width. At one end there is a seat, a carved entrance. None of the illustrations that exist in the literature is accurate. I noticed when I sat down that I had a clear view of the whole region. Humboldt said, and probably correctly, that this was a place to which the Inca betook himself when in need of contemplation, or when conditions demanded a view of the country.

But Ingapirca's greatest interest is attached to a legend. Here, it is stated, Huayna Capac, while making his usual inspection tour of the northern domains, received information from his runners that two great ships had penetrated the river at San Juan on the Pacific coast of Colombia. These ships were the galleons of Francisco Pizarro, the future conqueror of the Incas. At approximately the same time as the Inca, resting at this fortress of Ingapirca at Cañar, received intelligence of him, Pizarro was confirming the reports he had heard of a great empire that lay to the south, an empire as vast as that which Cortez had conquered. To both the Inca and to the conqueror, the knowledge of each other's existence was portentous.

Huayna Capac's legitimate heir was Huascar, his son by a woman of noble family of Cuzco (Peru); the other heir, whom he regarded with profound affection, was Atahualpa, his son by the daughter of the defeated Scyri of Quito. In 1524, seven years before his empire was to be levelled, he called to Ingapirca his sons Huascar from Peru and Atahualpa from Quito, and made known his wishes. Huascar was to govern the boundaries to the south, Atahualpa to the north; Huascar was, in fact, to receive four-fifths of the kingdom, and Atahualpa, the remaining fifth. This was really his legitimate inheritance, it having been the empire of his grandfather,

the Scyri. But since the Inca had first heard of the arrival of the strange men from the north, rumours had come down the Andes. Huayna Capac intimated to his sons and advisers, as did Moctezuma before the advent of the white man, that the invaders showed a greater civilization than theirs; omens everywhere—falling stars, earthquakes, extraordinary celestial phenomena—were an augury to the dying Inca of the empire's dissolution.

It is not altogether impossible in the decade that followed the conquest of Mexico and the death of the Aztec monarch, that news of this catastrophe may have penetrated to the Inca. The Aztecs had settled far down into Central America. On the Pacific coast, at least, archæological remains show a considerable interchange of customs as well as art *motifs*. Some inter-tribal communications must have existed. No greater calamities could have been conceived than the death of Moctezuma, the breakdown of the Aztec empire, and the conquest of all middle America by the white man. Intimations of disaster may easily have reached the Inca. An elderly man, weighted with years, to whom vision and prophecy were natural, he saw omens of a coming struggle. He committed his apprehensions to the servants of his empire and to his sons as they stood about him in the fortress of Ingapirca. They were all vowed to stand together and co-operate in peace and war. But with the division of his empire he planted the seeds of inevitable discord and later it fell 'in a cloud of golden dust through which flitted away dismayed hosts of Incaic aspirations, pursued remorselessly by the steel-clad myrmidons of an emperor even mightier than Huayna Capac.'

The rest of the history is well known. Five years after the death of his father, Atahualpa's restless energy made him descend into the Amazon to attempt the conquest of the fierce Headhunters, by whom he was routed, although a portion of the Upper Amazon remained in his hands. In the highlands again, he turned

to the south, where he was met on the plains of Riobamba and defeated by the forces of his half-brother, Huascar. Later he escaped from his imprisonment in Tumipampa at Cuenca, raised an army, defeated Huascar, and imprisoned him in turn. The arrival of the Spanish *conquistadores* completed a destruction already begun. Like Cortes, Pizarro entered an empire disrupted by a long, fratricidal struggle that had left gaping wounds in the defensive armour, both physical and psychological, of the Incan peoples.

CHAPTER VIII

‘THE WOOD THAT IS LIGHTER THAN AIR’

LIKE Atahualpa we had made our sally into the jungles of the Upper Amazon and far from being routed, as the Lord of the Incas had been four hundred years ago, we enjoyed a very fruitful six months among the Headhunters. Again we found the remarkable contrasts that exist in the small republic: it was a different world, only a four-day mule ride and three-day walk from the stone cities of the inter-Andean valleys. A world complete in itself, a law unto itself, where fine bronze savages, intelligent, proud and immeasurably free compared to the *serrano* Indians, reign unrestricted in the forests of the Amazon. We saw the intelligent craft of the Indians contrasted with a stupid terror which some remote ancestor had started and none had been able to stop—terror of witchcraft in which everything, alive or inert, is endowed with a living animus, ready always to upset the Indian in his daily routine and bring death to him. Retaliation, feuds carried from generation to generation, enemies’ heads shrunk to the size of one’s fist, and a world of horrible nightmare, are the heritages of the otherwise proud savage.

But among these Indians we gained an even deeper insight into what keeps this Republic a series of unconnected parts, created by the towering Andes and held apart because of the very inaccessibility they have created. So much did we find there that I wrote a separate book on that journey alone¹ and even after months we would not have emerged had not the time come to return to the hub of things, Guayaquil, to prepare for our expedition to the Galápagos Islands.

¹ *Off With Their Heads*, Macmillan, 1937.

In July 1935 we again arrived in Guayaquil. A year had passed since we entered Ecuador. We had crossed the Andes four times, tread almost the whole of Southern Ecuador from the sea coast to the Amazon, and although in one year we had viewed more of Ecuador than most of her nationals had in their whole lives, still we had much to see.

Guayaquil had not changed. The same tables lined the street cafés. The same Indian police officers stood in the centre of the streets in their khaki uniforms with dangling sabres. The same smell of drying cacao beans assailed our nostrils. The Balandrias still poured down the river; vessels from the outer world still made the journey up from Puna Island to disgorge the tourists who wished to see a tropical port during the few hours allowed them on their schedule.

But we were part of it now, and, as part of it, we had to accept the inevitable delay which accompanies all things in Ecuador. The schooner, *San Cristóbal*, which we had engaged long since to carry us to the Galápagos Islands had not yet arrived from her last trip to the Islands, and when she finally did the manager informed me that it would be laid up for some time in dry dock to prepare for the return.

So we idled in Guayaquil. Christine and I were surprised to find few of the old residents travelled. What most of the foreign colony of Guayaquil knew about Ecuador they gathered from other visitors, or on trips that took them from Quito and back. We were unable to adjust ourselves to their methods of wasting time. Once our plant collections, and collected material of insects and bird fauna had been labelled, prepared and sent off to the museums, and the ethnological collections from the Jivaro Headhunting Indians were packed and ready for shipment, time was heavy on our hands.

We had explored the city thoroughly and already knew what lay behind the waterfront, so we decided to visit the hills of Santa Ana, which rise two hundred feet above the river, east of the flat, low-lying section of

modern Guayaquil. A fort is at its base, and from it, winding upward, are small streets, lined with royal palms, hiding quaint ornate residences, ensconced in rich gardens of tropical flowers. The streets were made for the traffic of colonial Guayaquil in the seventeenth century when the hills of Santa Ana had only seventy houses, a *cabildo*, or municipal building, and four churches. Yet it had also supported a soap factory, a saw mill and a ship-building yard from which came, in colonial times, some of the largest ships that were built on the coast. One ship of 700 tons, built in the late eighteenth century, was much admired abroad for its lines and general architectural merit. Exports in that time consisted of lumber, cloth from the Sierra, carved, gilded virgins from Quito, cow hides, saddle bags, hats, blankets, cheese, and tar. Then the population of Guayaquil was only about eight hundred people, yet it was one of the most important ports of the Pacific, south of Panama. It became such a valuable centre of shipping that the Dutch, French, and English pirates would always call at Guayaquil when their raids failed elsewhere.

I found a list of instructions and a map in the British Museum, made by a contemporary seventeenth-century English pirate, with minute instructions on how to get into Guayaquil, the place to anchor, the place to raid, all in frank, open, free-booting spirit. I had remembered reading in William Dampier, the more literary of the pirates who sacked the city, that 'from Guayaquil comes gold and from Quito very good strong Broadcloth with images for the uses of churches. But more Especially cocoanut (whereof chocolate is made) which is here supposed to be the best in the world.'

At one spot on Santa Ana, a cliff overhangs the Rio Guayas and, as the sun was hot, we made for a shade tree nearby. As we walked toward it a young boy approached us and asked:

"Señores, would you like to see 'El salto de Guayas' ? I would be happy to guide you to it."

I racked my brains to think of a 'salto de Guayas,'

remembering no waterfall (*salto*) on the Guayas and having reached that mental conclusion, I put it to the boy, adding that as we were tired, we would not care to walk any farther at the moment.

“But,” protested the boy, “you are right by the *salto*,” and he walked in the direction of the high cliff. At the precipice he stopped and pointed below. I saw nothing of the *salto*, only a whirlpool that gyrated furiously near the cliff as the muddy river current swept past it.

“That, señor,” the boy uttered triumphantly, “is the ‘salto de Guayas.’ From this spot the Indian chief, Guayas, jumped rather than be held captive by the Spaniards.”

I then remembered that *salto* meant a jump or a leap as well as a waterfall. Since we looked a little blank, the young boy favoured us with more details.

“Guayaquil gets its name from Guayas, who was the Indian chieftain of the town and from his wife Kil. He and his wife, after the conquest of the town, were held in chains until he revealed where he had buried his golden cache. Guayas finally led his captors, who also brought with them his wife, to this spot at Santa Ana, overhanging the Guayas. Then, distracting the Spaniards’ attention for a moment, he seized a sword from one of the soldiers, ran his wife through with it and quickly withdrawing the sword held the Spaniards off while he said: ‘Not one treasure do I take with me, but two, my river and my wife, Kil. The first you soil with the blood of my people, the other, Kil, I take with me so that her beauty be not spoiled and profaned before the mansion of the true God . . . the Inca Sun.’

“And so,” the boy went on, walking once again toward the cliff that overhung the whirlpool, “Guayas turned the sword upon himself and tumbled lifeless into the water at this cliff; thereafter the water continued to whirl at this spot where his body fell into it.”

I thanked the youth for his information, and gave him

some money, at the same time inquiring, ironically, if he were sure that that was the cause of the whirlpool.

The boy pocketing the money smiled: "How else, señores, could such a whirlpool have been created?"

Although Guayaquil is an old city (established in 1537) nothing there seems ancient. This is because of its disastrous fires in the past. At intervals of about fifty years Guayaquil has burned to the ground, rising again each time like the Phoenix from its own ashes. Since the last fire in 1896, when two-thirds of the city was destroyed, a number of the buildings have been erected of cement, and a modern fire department has made its appearance, the members of it forming a very highly honoured fraternity, having their own burial niches in the cemetery, and, more important, their own supply of water for fighting the fires, in a reservoir on top of the hills of Santa Ana.

"You see," said an acquaintance to us one day, "we are not as progressive as you might wish to see us, not because of our lack of *élan*, nor our industry, but because of the scourges of the past, two of which still plague us." He held up his fingers. "First," said he, "there were the pirates, who periodically carried off every bit of wealth of Guayaquil. Those are gone now, although some people of Guayaquil will dispute this point. Then there have been our periodical holocausts. We still have fires daily, thanks to our wooden buildings, but our fire department is getting more and more efficient. And the last plague which handicaps us, are the *comejens*. Alexander von Humboldt said that we are backward because the *comejens*, or termites, devour our books so fast we are not able to accumulate large libraries."

"Now, as much as I resent this jibe at our intelligence, what Humboldt said is figuratively true. In Guayaquil you sit on a chair and it gives way beneath you; lean against a door jamb and you might fall down with the door you tear out. Look at the uprights of this building," he pointed to an upright that had great blisters raised from their surfaces—"see these blisters—touch

this fragile shell and your finger will penetrate it. From that gaping hole will run, as you doubtless know, small brown pellets, like sand running from a broken minute glass. It is the mark of the *comejen*. Why, most of our buildings look as if they have lain in salt water for years and that thousands of *toredos* have made their homes in them. That is why we build our houses here of lignum-vitæ wood, iron wood, and even the termite can't touch that, although it is about the only thing that it won't touch. Of course, all this termite drilling makes the wood of our houses perfect flues, aerates the wood, you know, and the houses go up like excelsior when fire reaches them.

"I have something that will amuse you as an entomologist," he rambled on. "While in Quito in the archives, I ran across a curious royal decree signed by Carlos III of Spain. It was a royal tantrum caused by the destruction of a case of gun flints which had been shipped from Spain to Panama *en route* to the Viceroy of Peru who had good need of them as the Indians were rebellious. The Viceroy waited and waited but nothing was heard of the gun flints. He made official inquiries in Spain. The Court interceded and asked the Governor of Panama what had become of the gun flints. In his answer, the Governor stated that the *comejens* had destroyed the cases in the royal magazine. The minister in Spain, being ignorant of just what a *comejen* was, issued an order under the Royal Seal, commanding the Governor of Panama to apprehend this *comejen*, wheresoever he should be caught; to form a summary process with a list of the crimes that he had committed and to send the prisoner and documents, with the necessary guard, to Spain, where the *comejen* would be dealt with according to the extent of his criminality."

After some days in Guayaquil we knew why the foreign residents had fallen into cliques that played golf, bridge, or else drank themselves under the café tables—anything to escape the perpetual ennui of Guayaquil.

Like them we usually sat during late afternoon at one of the sidewalk cafés that line the principal streets, watching the crowds walk up and down in the cool evening breeze, as the sun sank. There is no twilight on the Equator, no gloaming, no interval between daylight and dark—only a brilliant illumination and then the sudden disappearance of the red ball of the sun. Light is extinguished suddenly as if by a controlled mechanism.

This moment between day and night is the signal for the promenade and comely young dark-eyed women dressed in the latest mode, walk with their escorts in the cool breeze of the *chanduy* on El Malecon.

We longed, however, to escape for a while from Guayaquil. But where could we go? At any time the schooner *San Cristóbal* might be ready to sail, and with the uncertainty of communications in Ecuador we might not return in time to claim passage on the vessel as prearranged. The only spot of activity throughout the day was the river, and from our hotel, after meals, we would wander down to the Malecon and watch the sweating, swearing stevedores load the vessels with tropical produce. As a background to this human activity the river flowed powerfully by, bearing its mud-laden water to the sea. But of all the flotsam and jetsam carried by the Rio Guayas, nothing interested us more than the giant rafts that daily drifted into Guayaquil. Some were two hundred feet long, made of balsa, and perhaps a few bamboo poles, and tied together with withes from jungle lianas. Usually their awkward bulk was manipulated by five men, with the helmsman in charge of an enormous rudder, fully twenty feet long, by which the raft was both steered and propelled forward, while the others stood by with long poles to push it over shallow or sluggish places. The course of the boat and its speed were decided by the force of the current and tide. The freight of fruit which the raft carries and the balsa wood, itself, which is the most important, bring them small return for the time they

expended in cutting the trees, making the raft, and floating it downstream, but their needs are simple, their desires equally so, and time is the cheapest of all commodities.

One day as one of the balsa rafts moved into the river bank, Christine and I walked down to the edge of the water on our usual stroll and watched them unload their oranges and pineapples.

A citizen of Guayaquil stood idly by chewing a stem of sugar cane.

"Oiga, amigo," I said with the familiar prelude to starting a conversation with the *costeños*. "Where do these balsa rafts come from?"

"Up the river, señor," and he completed this vague information with a wave of his sugar cane. "Way up the river, where the balsa tree grows in the forest," he added quite unnecessarily.

"Is there any way of getting up there without going by canoe?"

"Seguro, seguro, señor; certainly, look at those fine diesel boats," he answered indicating some long narrow boats in the river. "*El Mirador, El Condor, Cotopaxi,*" and he reeled off the names of the boats (for even a dugout is named in Ecuador). "They all go up the river to Quevedo where the *balseros* cut the wood." He turned to me—"Are you going up?"

Christine shook her head. "Not on those boats," and her jaw set firmly.

As I started to speak she said.

"Now don't urge me. You know how I hate those small boats, the cramped quarters, the impossible food."

I remained silent. I had time and monotony on my side. Christine's reluctance was soon overcome as we had only a choice of remaining indefinitely in Guayaquil or varying its deadly dullness by going again into the forests.

One afternoon shortly after Christine's emphatic refusal we boarded one of the river vessels and became one with the highly communal Latin American form of

travel. Should your baggage become the seat for a swarthy *hacendado*, or if pineapples fall in your face as you swing in your hammock, you must accept these incidents with good grace. Once accustomed to the varied passenger list, and the inconveniences, we entered into the casual spirit of the trip and found our companions anxious and willing to cause themselves discomfort for the sake of their foreign guests.

It was just a few miles above Guayaquil that the majesty of the Rio Guayas faded and the river lost itself in small channels of the Rio Daule, the principal tributary of the Guayas which became more and more sluggish, the farther we went. Caymans appeared on the banks, lying with their mouths open, basking in the sun.

As the sun went down we slipped between grass-covered embankments, watching the usual parade of royal palms, broad-leafed cecropia, wild papaya, and a peculiar form of arrowcane. This latter forms beds of grass near the river and attains a height of twenty feet.

Ahead of us appeared egrets which alighted on trees near the stream and gently, unhurriedly rose when the boat neared. We saw two species of these egrets, one a powder-blue and the other pure white, whose charming presence in the landscape we owe to the Federal laws of the United States which prohibit the importation or possession of the feathers and down of the egret. The United States is the real and eventual market and if that law (passed to protect our own egrets of Florida) did not exist, this bird would have disappeared long ago.

After a night spent restlessly swinging in hammocks we arrived at the capital of the province of Los Rios, Bodegas de Babahoyo, generally called only by the last name. Concrete steps led up the high embankment to a small plaza, decorated with the usual ornate statuary and concrete benches. Royal palms swished in the afternoon *chanduy*. The large white, bell-shaped flowers of the Floropondios swayed gently in the breeze.

Formerly Babahoyo was a muleteer centre. Before

the railroad, and during the whole colonial period, this was the place of embarkation for Quito, which by mule and via the Andes is two hundred miles or eight days distant. Despite the railroad, there is still traffic from here to the Sierra. The Government has tried to make an automobile road and some cars have even passed over it, but as the road is not kept up it is folly to attempt the trip in a car. In colonial times the town was the storehouse for freight sent from Quito to Guayaquil, hence its name, *bodegas* (storeroom). Babahoyo is the Indian name. To-day it is also the dispatching place for Panama hats which come from Cuenca.

At Quevedo, two days' travel up the river, we arrived at the terminus of the launches. To proceed to the balsa regions we were provided with horses through the kindness of the American representative of the Balsera Corporation, the owners of the balsa plantation, the only one of its kind in the Americas. Ten miles from the town of Quevedo, on the Rio Camerones (the river Guayas changes its name every fifteen miles) this American company has laid out a great tract of balsa (*ochroma*) wood. Since 1931, 150,000 balsa trees have been planted. As they grow in eight years from saplings to tall trees, eighty inches in circumference, this plantation constitutes the greatest concentrated source of balsa that exists.

Although balsa is now almost synonymous with model airplanes, its uses are more universal. Life preservers are now made of balsa; aeroplane struts are filled with balsa sawdust; surf boards are made of balsa wood, as well as insulation for refrigerators.

Balsa to the Ecuadorian means both the wood of the tree as well as a raft made from it, and belongs to the age of the Incas when they ruled not only the land along the Pacific, but the sea as well.

When Francisco Pizarro was sailing along the coast of Ecuador from Panama, to investigate rumours of a great kingdom to the south, his men descried sails of a vessel. Pizarro, thinking that some Spaniard had

forestalled him in his discovery, cleared the decks for action, but when they neared the craft they found it was no ship but a gigantic raft of pale light wood, lashed together with vines. From its centre was a tall mast, supporting a single lugsail made from cotton. Built upon the base of the raft and raised like a quarter deck was a kitchen, with clay pots set on a brazier of coals. The vessel was being steered in the same fashion as the balsas that now come down from the Rio Guayas, and was the highest development of sea-going craft that any pre-Colombian peoples ever reached in the Americas. On this buoyant raft the Conquistadores bestowed the name of 'balsa' and so it has remained.

While the light-weight wood is found almost everywhere in the American tropics, two Ecuadorian species of balsa are of considerable commercial value. The soil best suited for it should be sandy and well drained, which with a heavy rainfall insure a rapid growth which gives it this singular lightness. Yet its lightness does not impair its strength, for balsa weighs the same as cork, but its utility is greater, for cork is only the bark of the Spanish oak, while the whole of the balsa tree can be used.

The forests about Quevedo offered a striking contrast to the high, windswept, hail-pelted Andean *paramos* which we had lately left. In this lush lowland (as in the Upper Amazon), things grow uncommonly fast. There are reptiles, most of which are nocturnal, jaguars, hosts of monkeys, and sloths, instead of the solitary lord of the Andes, the high-flying condor. In these jungles we watched, yes, and felt, the insects; big and little, always ubiquitous in their ceaseless humming, biting, and stinging, making life miserable for man and animal alike. We had had a feeling of freedom, space, and grandeur in the lofty peaks of the Andes, but in the jungle, with the giant trees hemming us in, I, at least, always had a sensation of claustrophobia. In jungles such as these we saw the balsa tree growing, and when we were there in August it was in bloom.

From the tips of the branches the ivory-coloured, vase-like flower stood erect at least six inches, festooning all the trees of the plantation. Bees, birds, and even monkeys came to visit the flowers, stopping to suck at the nectar within.

Later, this blossom gives way to a light fawn-coloured cotton ball, the size of a man's hand and as soft as silk, which are the seeds of the balsa. The winds coming down from the Andes catch up the fluffy cotton, sending the seeds to earth to begin again the eternal cycle of growth.

When we were finally installed in the combination dwelling-office of the Balsera Corporation, Herr Klinger, the German manager of the balsa plantation, took over our education from that point on. We followed him into the plantation on his usual inspection tours and, from the various questions we asked him, began to formulate some idea of the tree itself.

“Well, to begin at the beginning,” he told us, “you start a balsa farm by cutting the virgin forest and firing it, just as the natives do when they plant their corn-fields. No sooner have you cleared it than the seeds of the cecropia come swooping down and you've got to plant your balsa quickly.”

“You see these bamboo tubes,” and he pointed to a large section of land where there were bamboo tubes four inches in diameter set upright. “Well, in here we put the seeds of the balsa. When it grows to be four or five inches high we transplant it in this open field, and, like Jack and his bean stalk, in a year we've got a fine balsa tree, three times my height.”

“Then it should not take long for a balsa tree to be marketable?”

“No, sir, eight years; about the fastest growing tree there is in the tropics, and that is the idea behind the planting technique. As I told you, we don't cut the undergrowth. Make the tree fight for light, hem it in on all sides, make it dark and dank and the balsa has got to shoot up and get its lick at the sun. Yet there is more to it than this. Did you ever see a balsa *macho*?”

"A male balsa," broke in Christine, "I thought that there were no males; I'm sure I was taught that the male and female organs are contained on the same balsa tree."

"Well, you're right there, Madame, but I don't mean the reproductive organs, I mean the tree. Come here and I'll show you. I get to know the *macho* trees from the ones we call *hembra*—the females."

We walked down the dark balsa plantation. A path only wide enough for a mounted horseman to ride through was cut in the forest. The undergrowth was heavy. In the mass of trees we could make out the mottled, fungus-specked trunks of the balsa. Our host preceded us, heavy machete in hand. "Listen to this," he said, as he struck at the balsa tree in front of us. "Did you hear that squishy sound? Well, that is the way a female balsa, an *hembra*, as we call it, should be. Sounds like cutting into a thick piece of cactus, doesn't it?—and the machete goes right through. Now I'll show you a *macho* tree."

A few feet away was another tree similar in appearance.

"Here, you strike at the trunk of this tree," he said, and gave me the heavily bladed machete. I did so. There was no 'squishy' sound, as he called it, it only had a hard metallic ring. The machete penetrated only a fraction of an inch.

"There is your *macho* balsa, as hard as any other tree of the forest. Why, this thing won't even float."

"But why——?"

"We don't know, Madame, that is just one of our headaches. There are two reasons in my way of thinking. This tree," he said, indicating the *macho* tree, "has, as you can see, a lot of branches coming out from its sides. Now, when a tree has a lot of side branches its got to have roots below to equalize and balance it. That may be why the tree turns hard. Another reason—mind you, it's only a guess—why they might be hard, is this. I notice that the trees near the road are *machos*. Now, the natives slash at them with their machetes as they go



IVER SCENES ALONG THE RIO GUAYAS AT GUAYAQUIL

(Top) The water-taxis that eagerly seize all customers.
 Bottom) All ships are besieged by vendors offering the varied produce of the country.



YOUNG BALSA TREES SIX MONTHS OLD GROWING IN
THE CLEARED JUNGLE OF THE UPPER RIO GUAYAS

by. Perhaps you have seen them. They always carry a machete and they slash at anything to keep in practice. Well, when the balsa is cut, all the forces in the tree rush up to repair the wound, the tree quickly builds around the wound and that part hardens—maybe the hardness spreads—but whatever it is, I wish some smart young botanist from the States would come down and tell us why it happens. It's driving us balsa planters wild."

"Did you say balsa planters? I thought this was the only balsa plantation in the world, or at least in the Americas?"

"Well, there are one or two more; two Germans by the name of von Buchwald have only lately begun to plant the balsa. Between us we will some day control all the available balsa trees. The Government makes no attempt to replant nor to make her nationals do it. There should be some law about it, but what can one do? The natives cut the trees close to the bank, make their rafts, and float them down. Now, the supply near the bank is almost exhausted; the native has to go far inland to cut his tree and drag it out. And even for the native, it isn't worth it. He gets five sucres for a balsa log twenty feet long and two feet in diameter. Five sucres—that's about fifty cents. Why, do you know when I was in the States buying a model airplane for my nephew, they charged me fifty cents for a piece of balsa as big as my hand? But to get back: you see, it doesn't pay the natives. Soon all the balsa will be gone. In a sense we are doing the Government a service by planting the trees. Of course, we are doing this for profit, but at the same time, we are keeping alive the source of balsa. Why, Ecuador controls ninety per cent of the balsa of the world and they will lose it, just as they lost quinine and rubber to the Malaya planters. Now, as I say, I think we are doing them a favour, but recently they cracked down on us; they said balsa is not a permanent land-holding crop, and they are making us plant cacao trees around the whole plantation."

On the last day of our two weeks' visit, wandering over

the balsa forests, a telegram came informing us that the schooner *San Cristóbal* was soon to sail, so we packed our meagre gear and went out to see the final stage of rafting the balsa logs.

Bullocks dragged out the trunks, then the balsa was skinned of its bark, dragged down to the river and pulled up to the other logs in the water. The green balsa floated just like a piece of cork.

A little boy, twelve years old, at the suggestion of the manager, picked up a freshly cut balsa log, ten feet long and two feet in diameter, lifting it on his shoulder without any effort at all.

We stood watching the natives raft the balsa. The manager, after giving instructions to the men who were to take the raft down to Guayaquil, walked back to join us.

"A mighty nice business we could have here, if we could get the people in the United States to use balsa instead of cork. But they are afraid to and I can't blame them. They told me if they break off their contacts with Spain for cork and take to using balsa, how do they know that they can continue to get it from the American tropics? I was in on the early rubber boom. I saw the natives fell the trees to bleed them and I saw the stuff they would put inside of the rubber. It was sold by the pound, you know, and I would get big balls of the latex with rocks, lead, even old shoes, anything to bring up the weight. Well, you can't do business that way. Consequently, the planters took rubber to Malaya. The same with quinine. At this spot, Richard Spruce, the English botanist, collected and carried out the quinine plants which now grow in Malaya and India. Balsa will be next. The Latin Americans blame us for bleeding them and robbing them of their natural resources, and I only wonder why they don't realize that they themselves, in many instances, are to blame."

"By the way," he interrupted himself, "how much in a hurry are you to get to Guayaquil? When does your boat sail for the Galápagos Islands? Two weeks?

Well, you haven't much time. You still wish to leave to-day ? ”

“ I think we had better, Herr Klinger. We have much to do as yet, although a good deal of our gear is ready to be placed aboard.”

“ Well, I will send your things down to Quevedo where you can get the boat that leaves to-morrow. Meanwhile, if you wish, you might find it interesting to ride down to Quevedo from here on a balsa raft.”

I looked to Christine for her assent, for she often balked at the river. Seeing no revolt in her eye, I accepted. We climbed down on to the giant raft, taking our places beneath a small structure of thatched plantain leaves. The raft was poled out into the centre of the river and was there caught in the full force of the current. The polers worked desperately to assume control of the unwieldy craft, and when they had done so the balsa raft travelled down to Quevedo, we sitting in its centre like the Incas of old.

CHAPTER IX

THE LITTLE BROWN NUT THAT IS CHOCOLATE

THE *San Cristóbal* was in dry dock. One look convinced me that my informant had brought us back too soon. The schooner would not be able to sail for weeks, although the captain said 'days.' We made it a practice to appear at the dry docks every day, hoping that our irritating presence would spur the men on to make the schooner ready for sea more rapidly. As the vessel was at the end of town, near the Hills of Santa Ana, we had to walk down the side streets of Guayaquil behind El Malecon and so were forced to thread our way daily through a maze of tarpaulins which were stretched across the streets. On them were dumped huge sacks of brown cacao-beans to dry, while myriads of women and children swarmed over the kernels culling out the poorer grade of bean.

Our interest began to grow in this principal export of Guayaquil and, as the captain of the *San Cristóbal* saw us lingering over a pile of the beans one day, he inquired if we had ever seen a cacao plantation.

"No? Well, I would be delighted to write a letter to a friend of mine who is *hacendado* of Tenguel, the largest cacao plantations in Ecuador and suggest that he allow you to stay with him and study the cacao plant."

Christine and I exchanged glances; we suspected that he wished to be rid of our daily inquiries.

"You don't think we would miss the sailing of the *San Cristóbal*?"

"Oh, no, señora," he answered Christine, "Tenguel is only an over-night ride in one of our river-boats, and I

will personally telegraph you just as soon as the *San Cristóbal* is ready to sail."

"Well, señor Captain, if we have your promise to telegraph us," I said resignedly, "we shall be happy to avail ourselves of your suggestion."

So the continuing delay of the sailing of the *San Cristóbal* once again allowed us to look into another Ecuadorian industry—this time one of the most interesting contributions of the American Indian to the taste of the world—for cacao, when dried, toasted, and ground, is our chocolate and is as ancient as its name.

Linnæus, the Swedish botanist, described the cacao plant as *Theobroma cacao* (from *theos*, god—*broma*, food, hence food of the gods), and to the ancient Aztecs it was divine. Used as money in some parts of Mexico, cacao was one of the tributes demanded by the Aztec nation from the other Indian peoples they had conquered. They called it *cacahuatl* (and by the transmutation of mispronunciation, was passed to the Spaniards as *cacahuâte*, chocolâte, and so on, until all the nations of the world to-day pronounce the word in their own manner as corrupted from the original Aztec).

When Cortés came into Mexico he found whole groves of cacao trees being cultivated by the Indians, and he was surprised to learn, when he visited Moctezuma, that this ruler consumed over fifty jars of this delicate drink daily, apart from the two thousand jars which were consumed by his retinue and household. The froth of the cocoa, flavoured with vanilla and other ingredients, was coloured with the red dye, *achiote*, and beaten with a *molinillo*, until the foam was of almost solid consistency, being conveyed to the mouth with a tortoise-shell spoon.

The 'Anonymous Conqueror,' a chronicler of that Conquest, in partaking of this chocolate foam was always careful to calculate the importance of 'opening the mouth wide in order to facilitate deglutition, that the foam may dissolve gradually and descend imperceptibly, as it were, into the stomach.'

In 1640, Anne of Austria, a daughter of King Felipe

III of Spain and wife of Louis XIII of France, first introduced chocolate into the drawing-room. By the time of Charles II, it had reached England, not by the way of Europe, but through the buccaneers who, running wild on the Spanish Main, had brought it back to Merry England. It was then advertised at six shillings and eightpence a pound, which, when one considers the purchasing power of the Restoration shilling, made chocolate about five dollars the pound.

Reflecting on these historical events we boarded one of the river-boats and set off down the Rio Guayas.

As the cold misty day broke, it was with relief that we saw the Island of Puná rise before us. All night we had been precariously perched in blue denim hammocks, stretched athwartships, which had kept perfect rhythm with the swinging boat. Puná, at the mouth of the Rio Guayas, sixty miles from Guayaquil, lies across the delta of the river like a piece of steak in a platter, a spheroid, alluvial island, which one must pass to get to the open sea.

To the north of Puná there is an ever-shifting, dubious channel, which only small ships use, and to the south there is the relatively deep channel, which is followed by the liners, passing alongside of Puná and through the Gulf of Guayaquil. As the Gulf is shallow, cross currents and conflicting winds make the water unpleasantly choppy, and our small, Diesel-powered river-boat turned and twisted throughout most of the night. The creaks and groans coming from the hull sounded like a rheumatic man being turned in his bed and kept us from sleeping.

Along Puná's shores there is a thick screen of mangroves which conceal narrow salt-water estuaries, penetrating far into the interior, almost cutting the island in half, and from noisome slime come black, rapacious, hard-biting mosquitoes, for which Puná is famed.

Our small boat came to a stop. The sailors hopped into the water and pushed the craft ashore where we

were met by the *teniente político*, standing, arms a-kimbo, with his shirt out, the tails tied about his middle, Mexican style.

There were only a few houses, not more than twenty, following the typical architectural pattern of Guayaquil, the sides covered with split bamboo, roofed with rusted corrugated iron. The church, an unimpressive structure, had no priests, for it was unprofitable to conduct services for this poverty-stricken population.

It is difficult to believe that this island was once the home of a tribe so ferocious that even the Inca could not subdue them. Many sanguinary battles were fought between the tribes of Puná and the Inca's legions and, later, those of the Spaniards. Pizarro met his first bitter defeat at this island and nearly lost his force in a short skirmish. Nothing remains of Puná civilization, although I have seen some artifacts taken from mounds in the interior which convey the impression of a civilization much advanced in the arts.

From Puná we sailed for the eastern side of the Gulf of Guayaquil, which, unlike the barren coastal ranges of Peru beginning a few miles south of Tumbes, is humidly tropical. Seven rivers, in addition to the Río Guayas, pour into the Gulf of Guayaquil, all within a distance of fifty miles. These drain a considerable portion of the Peruvian and Ecuadorian Andes and empty an enormous quantity of fresh water into the bay.

The humid coast of the bay is an enclosed front of mangrove trees, which reach a height of forty feet or more, and which give off a peculiarly rotten, sodden smell. Attached to the mangroves were immense carton nests of termites. White egrets, perched in flocks in the foliage, and a powder-blue bittern, walked slowly from limb to limb, as our boat slowed down to enter the estuary which forms the mouth of the Río Balão. The stream led through the mangrove thickets, narrowing at parts to not more than twelve feet in width. A large green iguana, perched at the end of the branches, became aware of the precariousness of its

situation and slipped into the water when we were within twenty feet. A quarter of a mile farther along the estuary we reached solid ground and from there a horse-drawn, narrow-gauged car took us to the River Balão, which we crossed in a canoe to the town.

Balão, the centre of the cocoa-producing *haciendas*, was the usual cluster of bamboo dwellings, roofed with rusted corrugated iron. Unfed dogs moved about us. The villagers had recently killed a steer and its skin had been stretched upon the ground, where buzzards, as eager as their Andean cousins, the giant condors, came flying down to have a tug-of-war over a long bit of the steer's intestine.

The natives, who stood about staring curiously at us, were a remarkable contrast with the highlanders; emaciated with sallow complexions, most of them had swollen stomachs and spleens, evidence of pernicious malaria. The young women had lost most of their teeth, which is common among the coastal types. The children, like those of the highlanders were dressed in small jackets, played in the mud on the street or on the mud floors of the interior of the houses. These were not like the healthy ruddy-cheeked children of the highlands, but frail, spindle-legged, ricket-racked babies, who had begun life already handicapped. The men were the least pleasing of all, being short, small-boned and emaciated. The machete, which on the coast is the native's one weapon, was held in the hand or across the arm.

What an amazing contrast between these unfortunate *costeños* and the happy healthy *serranos*! We were astonished at how much locality means to the health of a people, for a tropical environment multiplies a thousand-fold the importance of the animal and plant world in relation to man. In these forests, where the high humidity supports a wealth of parasites, the worker is subject to one or more fungoid growths known as *mal de pinto*, which disfigure the skin. Mosquitoes, flies, and other insects that fill their houses bring the *costeño*

a never-ending retinue of diseases. Their eating habits do not help them, for the diet is almost pure starch. Rice, fried bananas, occasional bits of meat, but rarely fresh fruits, leave the grown man with rickets carried over from his childhood.

These environmental conditions have been reflected in their manner of living. The fine emotional companionship that the sexes develop in other parts of the world under more fortunate circumstances is unknown here. These people seldom, if ever, caress each other, or even show an obvious emotion when one of them departs on a long journey. The man is entirely ignorant of or indifferent to the caress, and all of the accompanying phenomena of this instinct is entirely absent in the Cholo-Indian psychology.

Courtship is brief and to the point. They pass over in a moment that which we may dwell upon over much. The women seem to know by instinct, if not by actual observation, those for whom they will serve, and so readily consent to this expedient state of matrimony. In contra-distinction to the Sierra, where legal wedlock is the rule, it is an exception here on the coast. When the padre pays his annual visit, marriage can be sanctified, if there is enough money. But married or not, what boots it? The offspring are referred to as *hijos naturales*, natural sons, and it is a fine commentary on their social justice that in Ecuador little attention is paid to illegitimacy.

Without our being aware of it, while walking about the heavy mist had soaked much of our outer clothing. Technically we were in the *verano*, the summer, but there is really no dry season here. The *garua*, the heavy mist caused by the reaction of the cold Humboldt Current (which comes from the Antarctic) on the warm air of the coast, drifts across the flatlands, strikes the spurs of the Cordilleras and inundates the whole region.

We stepped in to change our clothes at one of the small houses whose bamboo walls were papered with old newspapers from Guayaquil. When we emerged we

were relieved to find that the Superintendent of the cacao plantation had come with riding beasts to pick us up. This full-bearded man, with a great hat, lost no time in telling us that he was a Colombiano, to set himself apart from these people, and begged us to mount quickly so that we could make Tenguel before dark.

The cacao plantation began at once on the other side of Balão. As we rode along, the black-bearded Superintendent entertained us with an account of the life history of the cacao tree.

After the desired area is cleared and burned, the larger trees are left to rot and provide humus for the soil. The trees which are first planted in small bamboo trunks to sprout are transplanted into the cleared plantation. Simultaneously, there is planted a tree called the *madera negro*, the black tree, which when fully grown will provide the shade that the cacao needs. Often banana and coffee will be planted beside the cacao tree to help utilize the plantation and assist in making a return for the field until the cacao is in production. The rich mould produced by the falling leaves is not removed from the ground, as this adds to the fine rich humus necessary for the cacao's quick growth. When the tree is six feet in height and three or four years old, it has already begun to produce. By the time it is ten, it is fruiting twice a year.

The blossoms of the cacao do not come on the tips of the branches as do other fruits, but grow directly on the trunk of the tree, beginning a few inches from the ground, up and about all the principal branches. Twice a year, in June and December, the fruit is harvested, and in that short time it has grown into a cucumber-shaped green pod, ten inches long and as thick as a melon. In the Ecuador species, the fruit facing toward the sun first becomes yellow; in the Venezuela species, it becomes a fiery red.

We passed workmen returning to the plantations with long bamboo poles, at the end of which were sharp knives. These poles, twenty feet in length, serve to cut

the pods in the taller trees. When cut, the pods are piled in regular heaps in the clearing between the trees, each cacao tree under normal conditions yielding about two and one-half pounds per tree, approximately four hundred pounds to the acre.

The last hour of our journey we broke off conversation with the *hacendado*, as we compared the jungle of the cacao regions to those of the Amazon where we had just been. Christine constantly called my attention to plants that she had collected in the Oriente, for the jungles around the cacao *hacienda* are almost as profound as in the Amazon. As in the forests of the Oriente, here lurk the jaguar, the ocelot, the tapir. Some species of monkeys are numerous, and especially snakes, headed by the greatly feared Fer de lance, whose bite causes many deaths annually among the cacao workers.

The old cacao trees without exception were covered with orchilla, a greenish grey moss which we met again at the Galápagos Islands. Palms and tree-ferns were numerous and the various orders of the fig trees were everywhere.

These cacao regions are the most southern extension of the humid tropical regions of the Pacific side of the Americas. At the Bay of Guayaquil, the humid tropical zone is ended by the effects of the cold Humboldt Current, and southward from the beginning of Peru the whole Pacific coast is a country of deserts. As if to make up for this, Nature here seems to have redoubled her efforts to make the vegetation as luxuriant as possible. Plants grow upon the tile roofs and the trees bear hosts of epiphytes and orchids on their boughs.

As we neared the *hacienda*, a worker who had ridden ahead suddenly took off his hat, lowered his head and mumbled a prayer. I looked at the *hacendado* and saw that he had uncovered also. Christine prodded me to remind me of my manners and I took off my hat, not knowing the reason until I saw a large ornate gate hanging by one hinge and behind it a great number of tombstones: it was the *campo santo*, the cemetery of the

hacienda. It was so overgrown with vegetation that I had failed to notice it, and would not have, had it not been for the iron gate. When we had passed and had put on our hats again the *hacendado* turned in his saddle and said :

"That is our *campo santo*. There are hundreds of people in that place, and the servants are attached to it, for there are the remains of some of the English people who owned this plantation."

A bit farther and we entered the *hacienda*, passing under a large ornate gateway also showing signs of neglect. The plantation was set off by a large plaza about which the houses were grouped, the usual type of dwellings, perched on stilts. On one side stood the dilapidated *hacienda* church. Everything about the place looked run down and shabby—an appearance which was augmented by the dismal perennial mist shrouding the place.

The mists, or *garua*, made collecting a problem. Christine had the utmost difficulty drying her plants because of the humidity. I, as a collector of insects, was far more successful. Termites, ants, beetles, curiously formed hemiptera, butterflies, the carnivorous praying mantis, came to me in mounting quantities and during the actual collecting I had opportunity of continuing my studies of the social system of the termites,¹ as well as the social system of the cacao workers.

Throughout the day at the *hacienda*, sad-faced little burros, bearing great canvas sacks at their sides, were driven across the plaza to the drying-sheds of the cacao-bean. There young boys would dig down deep in the canvas bags and pull up masses of the fresh cacao-seed surrounded by the white slimy pith of the cacao. The

¹ For those having an interest in such matters, I suggest :

Contributions to the Biology of the Nasutitermes, by Wolfgang von Hagen. Proc. of the Zoological Society of London. Series A, vol. 108, Part I, 1938.

and in a lighter vein :

'The Termite Queen,' by Wolfgang von Hagen. *Natural History Magazine*, April, 1937, vol. 39, No. 4.

ods of the cacao, when cut, are allowed to lie on the round in piles until they are opened by these boys, whose task it is to load the seeds, pith and all, and return them to the *hacienda*. When extracted, the seeds, which average about forty to the pod, are bluish white, and about the size of small almonds. This mass of cacao-beans is then laid on large bamboo trays to ferment.

Our host, the *hacendado* from Colombia, explained to us that fermenting, or sweating, is an important part in cacao production, as it chemically changes the inside of the bean by the absorption of the products of the fermenting and decomposing pulp. If the cacao-bean is not fermented it is so classed and brings a lower figure, for it has not the quality nor the flavour of the fermented bean.

"Have you seen," he went on, "*Comisionistas*, or Commissioners, in the streets of Guayaquil, tasting these beans? Well, anyway, you've seen them drying the cacao-bean in the streets? When you want to sell your cacao you go to an agent who sends over his taster. His man will walk through your beans, select them at random, bite them open, chew a bit of your bean, and on that selection grant you your price."

"Is that the sole manner of obtaining an offer for your crop?"

"The only one," he replied. "That is what makes cacao a very difficult business. These women and children," and he pointed to young girls and their mothers sitting on top of the large bamboo trays, "are selecting the beans. You see that pile beside them? Those beans that are mildewed and white are discarded and form a third- or fourth-class bean. But more than this, as cacao mildews quickly, it has to be shifted constantly. That is why we find it so costly, as every bean is hand-selected, gone over as you see these people doing. They get about a sucre per day, or, at the current rate of exchange, about seven cents, American."

"Well, I know that," said Christine, "for we sleep right over those cacao-beans and we hear them shifting

them back and forth at the crack of dawn. I never knew that chocolate had such a decided smell; the first day I could hardly stand its odour, though now I am used to it."

What disturbed Christine, as well as me, was the sharp, pungent odour that comes from the beans. The alkaloid theo-bromine (which is closely related to the alkaloid of coffee) that throws off these vapours caused a dreadful headache, which only isolation from the cacao-beans seemed to stop.

"Well, those vapours," answered the *hacendado*, "may give you a headache, but the shifting of those cacao-beans gives us a different kind of headache. It has to be handled more than thirty times before it is shipped, and that is what is ruining the cacao business. For that reason this *hacienda* is being sold to the United Fruit Company who will raise bananas here. They are taking it over very soon. And then there is the *escoba de bruja* that I showed the señora the other day that is ruining the business for good and all. The Government is offering a million sucres for a cure of the disease. You should stay here and try and see what you can do."

The *hacendado* did not realize that there is no panacea for the treatment of *escoba de bruja*—the witches' broom disease. That the blight has spread is due not only to the method of planting, but to complete lack of method in cultivation. The older trees are never pruned; never sprayed; just allowed to grow as they will and this disease, a fungus beginning on the tips of the leaves, soon spreads, for the spores of fungus are easily disseminated. The trees that we passed had the appearance of our northern trees in the autumn: many of the branches were dry, while the other part of the tree was healthy. Eventually, the whole of the tree dies. As the leaves swing in the breeze, giving out a perpetual susurrous, the native compares the rustling to the swish of a witches' broom, hence its name, *escoba de bruja*.

The picture given is perhaps too gloomy, for the cacao industry despite its rapid decline is still the chief export

f Ecuador. Of its \$17,000,000 exports, cacao takes up at least \$5,000,000 of that total, this is far below what it was in 1865 when Ecuador provided half of the world's supply of chocolate, which it continued to do until 1900, when Europe's annual consumption of chocolate was something over 197,000,000 pounds.

During our third week at the *Hacienda de Tenguel*, a message came through to us, telling us to return at once to Guayaquil. The schooner, *San Cristóbal*, was now about to sail for the Galápagos Islands and ever the hopeful, trusting tyros of travel among the Latin Americans, we terminated our stay quickly at the cacao plantation and returned to Guayaquil.

After all our disappointments, it hardly seemed possible that we were now actually going to the Islands. At first everything that could happen to thwart our plan did; at least, that was my view.

We had been in Guayaquil but a few days when a bubonic plague broke out. The city was subjected to a vigorous rat campaign, but deaths mounted in spite of precautions. The port authorities said that they would fumigate every vessel, foreign or domestic, that came into the harbour, and the foreign vessels answered by saying that if they attempted to they would pass Guayaquil by on their way to the South, and we thought this might prevent us from sailing.

As everything must end, even the bubonic plague began to quiet down and we were really ready—actually ready—to sail. Having made all preparations beforehand in the matter of food, supplies, and material (which lay packed and waiting at my agent's office on El Malecon), it was but a momentary matter for us to get things aboard for our long-delayed departure to the Galápagos Islands.

CHAPTER X

A SENTIMENTAL PILGRIMAGE

IT was September 1935. Christine and I were on board the schooner *San Cristóbal* bound for the Galápagos Islands, there to carry out an objective that we had been planning for two years. To mark the centenary of Charles Darwin's visit to the islands, we planned to erect at Wreck Bay on Chatham Island, the spot where he first landed, the monument which was safe in the hold of the schooner. The bust of Darwin was a replica of a portrait in the American Museum of Natural History, and had been sent to me through the kindness of Dr. Robert Cushman Murphy of that Museum; a plaster cast had been made of the original, and in Ecuador it was re-cast by a native sculptor. The inscription for the monument was written by the sole surviving son of the great naturalist, Major Leonard Darwin, of Sussex, England, and the plaque, containing the inscription, also had a portrait of Darwin as a young man. A copy of the portrait was obtained through the gracious offices of Mrs. Nora Barlow who had recently edited her grandfather's *Diary of the Beagle*.

Raising the monument was more than an act of biological piety. It was the beginning of a campaign to bring to the attention of naturalists all over the world, and to the attention of the Republic of Ecuador, to which the Galápagos Islands belong, the need for conserving the irreplaceable natural phenomena of the archipelago, and to save from extinction this living laboratory for the study of evolutionary processes.

Knowing the Latin Americans to be particularly receptive to personal appeals, I hoped by means of the



THE HARLEQUIN BEETLE PREPARES FOR ITS JUNGLE
MASQUERADE

onument to dramatize the need for protective legislation. In addition, I had designed a series of stamps which had suggested that the Republic of Ecuador issue to commemorate the centennial of Darwin's visit to her possessions. The stamps were to have been issued on 7 September 1935; they actually appeared six months later, a hiatus not due this time to traditional Latin-american procrastination, but to the deposition of the resident with whom I had carried on negotiations.

The sky was overcast during the eight days of our voyage. There was not a single movement on the broad expanse of the Pacific. On the afternoon of the eighth day the sea became alive with porpoises racing beside the ship. As far as we could see, the water foamed with their backwash. Hardly had they spent themselves than we were pleasantly startled by the pilot's shouting:

"Tierra, tierra, ya llegamos a Galápagos."

We had arrived. As if spent by the effect of getting here, the ancient motors of the rotting hulk of the *San Cristóbal* began to grind out their last dismal and shaking gyrations. We were now pushing our way to the 'weather-side' of Chatham Island, the port of call of the archipelago.

By dusk the entire silhouette of Chatham was visible. The sun, setting behind the mountains, cast all the volcanic bareness of the lower slopes into bold relief. On the weather-side of the island the lashing waves spent themselves frothing against the black lava precipices and the dull white foam surged away, leaving in its wake the faintest phosphorescent gleam. Darkness fell so swiftly that we could get no further impression save of the immensity of that dark towering hunk of cinder. Christine and I, leaning over the rail, spoke not a word as we gazed into the gathering darkness. All the nameless and unidentified terrors of the past, the misfortunes of other Galápagos *voyageurs* came to mind. We remembered the warnings of our friends that an indefinite stay on the Galápagos, without our own boat (so that we could leave when we desired), was courting

death in no uncertain manner. I recalled Herman Melville's description: 'No voice, no howl is heard: the chief sound of life here is a hiss.'

All these associations and recollections, coming upon us in the eerie fall of night, boded no good for our enterprise. Our enthusiasm ebbed.

This wholly volcanic archipelago is scattered over a water area of 23,000 square miles, yet the total land area is only 2800 square miles, more than half of which is contained in the largest island, Albemarle. The ten large islands and the score of smaller ones that form the archipelago are, superficially at least, similar, but each island, depending on its height and situation in the curious vortex of the currents, harbours a life peculiar to it. Darwin (who came to the Galápagos five years before Herman Melville), believed that the islands rose from the bottom of the sea during protracted periods of major volcanic eruptions which built up the towering craters. These erupted for countless geological ages (and continue to erupt to-day), pouring out lava streams that coalesced to form the larger basalt land masses. Later, the islands passed into a period of quiescence during which time minor eruptions built up the lesser craters. On every hand there are gaping craters, fumaroles, cones, vents, that reminded Darwin of the 'iron furnaces of Wolverhampton.' Along the littoral of the geologically more recent islands the lava seems as fresh as if it had just now poured from the bowels of the earth.

As much as the islands resemble each other in their common origin and mineral composition, all have their own peculiarities. Albemarle, the largest, is seventy-five miles long, forty miles in width at its greatest breadth, and has five large central volcanoes, the highest being 5000 feet above the level of the sea. One of these volcanoes is continually erupting sulphurous vapours. Most of the other islands slope gently up to one central extinct volcano; some are quite small with a height not exceeding 850 feet at the maximum.

Although 'toeing the line' and opposite the steaming angles of South America the Galápagos archipelago is not truly tropical. There are no palms, no fruited trees, save those brought by the hand of man in the last hundred years, and there is no water reasonably available. There is nothing about the islands to suggest a culture of equatorial exoticism wrapped in the haze of lush vegetation and swishing palms. The equatorial heat is modified by the Humboldt Current, producing a mean temperature of seventy degrees, creating, as it were, a permanent autumnal temperature.

On the lower levels the floral growth consists of a large proportion of towering cactus and a quite impassable *chevaux de frise* of mesquite, acacia, and other spined plants acclimated to the arid regions. Covering the lava that tumbles into the sea is a screen of manroves, set in thick noisome soil which acts as a habitat to hosts of rapacious black mosquitoes. About the few brackish pools grows a tree of attractive appearance, the poisonous *manzanillo*, to be avoided as carefully as poison oak. Although there is an abundant rainfall on the islands between January and April, it is lost in the raggy lava or percolates through the porous basalt into subterranean channels which flow down to the sea level, where brackish wells are formed.

Decidedly different are the zones that begin abruptly after the eight hundred foot altitude. Bathed eternally by the *garua* mist, forests abound with large trees, ferns, orchids, and lianas that envelop a mass of verdure not dissimilar from that of the South American forests. Tree branches are clothed with the pale green Spanish moss, like tropical Christmas-trees. The rain, the flux of temperatures, has brought about an erosion of the lava to form a rich black-brown earth a full metre in depth.

Throughout the centuries the islands received their plants and animals from the mainland. Air-currents carried the spores of the South American or West Indian flora that found root in the crannies of eroded

soil ; masses of mangrove from the coast drifted over to take root around the Galápagos littoral ; seeds of the larger plants, quickly drifting in the full force of the Humboldt Current, came to augment the floral growth. As the plants arrived, so came the avifauna in casual, accidental migrations. Boobies, penguins, cormorants, frigate-birds, albatross, following the currents rich in sea-life, came to the Galápagos archipelago and finding it a haven, remained. Land-birds, blown off their courses came in other migrational waves, but only those of a more northerly distribution, used to the autumnal wastes, remained ; here they continued on as permanent guests. There are no humming-birds, no parrots, no toucans, no trogons, or other gaudy inhabitants of the jungles. On the contrary the avifauna consists of dusky finches, grey mocking-birds, and drab-coloured doves, birds of a uniform unspectacular plumage, more often to be found in northern climes than on the Equator. There is only one note of colour, the brilliant roseate hue of colonies of flamingoes which build their rookeries along the shores of the brackish pools, sharing the salt-water ponds with native ducks.

What is there about these volcanic ash-heaps that makes them so fascinating to voyagers ? Why do they remain, of all sections of the earth, the mecca of scientists ? The reasons are partly historical, partly biological, but both are connected with Charles Darwin, for among these tumbled masses of lava the theory of evolution was conceived. It did not, to be sure, spring full-born from Darwin's brow as he set foot on these islands, but it was here that his epochal idea crystallized.

CHAPTER XI

THE GALÁPAGOS ISLANDS AND CHARLES DARWIN

IN 1831 H.M.S. *Beagle* was departing on a surveying voyage around Patagonia and the Straits of Magellan. The ship's captain, Robert FitzRoy, wanted to have as companion on this voyage someone interested in geology and natural history. A young man of twenty-two, Charles Darwin, a matriculant for the clergy at Christ's College, claimed the opportunity. He was not remarkable in either collecting-habits or the range of his interests. He was 'in sum a sufficiently commonplace child.' His father, Robert, a physician, even complained that if he did not give up his passion for shooting and rat-catching, he 'would grow up a disgrace to himself and his family.' He had failed in the medical curriculum at Edinburgh, and, although he was by no means an indifferent student, his interests in natural history and geology were only occasionally stimulated by a few of his teachers. When therefore Charles Darwin took his place in the cabin of H.M.S. *Beagle* and prepared to sail to South America, his zoological background reflected the ideas typical of his time.

Baron Cuvier, the French scientist, dominated intellectual thought at the beginning of the nineteenth century. With all the force of personality and philosophical brilliance, he ridiculed the more logical, but quite unorthodox, conclusions of Saint Hillaire, Lamarck, and especially Buffon, who suggested 'that mankind arose from one family of monkeys on the banks of the Mediterranean, who accidentally learned to use the thumb.' The learned Baron Cuvier was a most ardent

supporter of the theory of catastrophism in geology, and in his *magnum opus* he threw the whole weight of his influence thereto. He maintained, in order to explain the existence of fossils, that a series of tremendous cataclysms had affected the earth, the latest having been the Moachian deluge, and that each flood of waters spread over the earth, destroying, drowning the various groups of animals that had lived previous to each deluge. And each time the Lord remade the animals and saw that His work was good. In short, Cuvier afforded in his day, a 'certain scientific basis for the Mosaic account of the flood,' and, as was to be expected, such views were cordially received in London during the time of Darwin's youth. To be sure, there were sporadic revolts against this curious geological reasoning; the most audible protestant was the Scottish geologist, Lyell, who was at the time of Charles Darwin's departure engaged in writing a work on the *Principles of Geology*, the first volume of which was in Darwin's travelling library.

Darwin, in 1831, was a supernaturalist by training and by inclination. He had been trained for the clergy, and the situation had not yet presented itself wherein he had to make any decisions on the origin of things. His grandfather, Erasmus Darwin, had written copiously on natural history, but the verse of the elder Darwin, which contained the evolutionary germ:

"War and Pestilence, disease and death
Sweep the superfluous myriads from the earth"

did not move the young Darwin at all.

Not that he was not enthusiastic about his voyage; thoughts of it consumed all his waking hours, and his recently published *Diary of the Beagle* explains most graphically his hopes and fears. He had read Humboldt just before sailing. He fell under the spell of that great naturalist's *Personal Narrative of Travels to the Equinoctial Regions of America during the Years 1799-1804*. This book and the first volume of Lyell's *Principles of Geology* were the sources to which he referred again and again.

During the voyage down the South American coast Darwin collected enthusiastically of the birds, plants, and insects that were found everywhere in the tropical forests. Lyell's work reawakened an old interest in geology, for everywhere he found fresh proofs of the deductions of his mentor. At Bahia Blanca, in Brazil, Darwin found imbedded in the soft rock remains of prehistoric animals, bones and skulls of the great ground sloths, the megatheriums, the flat plates of armadillos, and the remains of a small fossil horse. This last was sufficiently puzzling, for he knew that horses did not exist in the Americas until Cortes brought them. Was it not strange that after each deluge God made animals in the same patterns, yet changed them radically each time? This was the explanation of the adherents to the catastrophic theory.

Lyell's explanation was different and everywhere the rocks shouted out confirmation to Darwin of the conclusions of Lyell: the incalculable duration of the geological periods, the law of geological change—constant and continuous. Two years later Darwin received the second volume of Lyell's geological work. Darwin was already strengthened by his own conclusions and investigations, and now Lyell freed him, for ever and completely, of the nightmare of Cuvier's absurd cataclysmal theory. The Scotch geologist had insisted upon the uniformity and continuity of the geological epochs, and, faced with proof in the rocks themselves, Darwin asked himself: If continuity exists in the inorganic world, would it not apply also to the organic?

In 1834 the *Beagle* was at the Horn, and Darwin was rapidly maturing. This was the result both of his own investigations and the companionship he shared with the captain, Robert FitzRoy. Young Darwin's rapidly developing theories could have had no better reagent than the conservative and illogical religious arguments offered by FitzRoy to confute the testimony of the rocks and the fauna. The latter was not only intensely religious in a bigoted sort of way, but he adhered literally to

the Mosaic Law: that man issued full born; that the animals and insects were perfected creatures from the ambidextrous magical hands of God. It must have irked the captain no end, to be forced to listen to the unorthodox postulates that the young naturalist offered in explanation of the fossils of different species of animals he was collecting. Ideas, inspirations, may lie dormant within us for a long time; so long as we do not give expression to them they remain half-formulated and amorphous. Conversation and argument supply the anvil on which conclusions can be hammered out. So did the long evenings of discussion and 'argument' between FitzRoy and Darwin serve their purpose.

The *Beagle* rounded the Horn and began its trip north along the coast of Chile. Darwin continued his trips into the interior; his Diary became filled less with personal interests and more with notes of the things that he saw about him. He climbed the Andes, he saw the condors, and by the time he reached Lima, Peru, he was an experienced naturalist. But even then, he saw no other future for himself than his return to England to take up his studies for the clergy where he had left off. 'To a person,' he wrote from Lima, 'fit to take office, the life of a clergyman is a type of all that is respectable and happy.'

Six months later there was a sudden change in Darwin's letters. He no longer visualized himself as settling in a parsonage. Now he wanted more than anything else to take up 'his lodgings near the British Museum within reach of his scientific friends.' What had happened? The *Beagle* had left Lima in September 1835, sailed directly to the Galápagos Islands, stayed there five weeks, and then begun the long voyage to Tahiti. The Galápagos sojourn was the only stop made at the time of Darwin's crucial change of attitude. From his own notes, from his autobiography, his Journal, his Diary, and a knowledge of what he saw, we can reconstruct the process of his metamorphosis.

On the Galápagos Islands Darwin found two types of

iguanas: one that lived on sea-algæ; another, confined to the land, that fed on cactus. Immense tortoises were distributed on many of the islands. Great depths separated the islands from each other; the tortoises could not swim, neither could the land iguanas. With his mind already impressed by the geological and paleontological phenomena spread before him on the South American mainland, Darwin was prepared to grasp the significant facts evident in the animal life of this group of islands. It was the tortoises and a drab species of finch, the *Ceospizida*, that first gave him an insight into the nature of variations. An Englishman resident on the Galápagos, during Darwin's visit, said that he could distinguish the tortoises from each island, although one could not believe, by looking at some of them superficially, that they had not come from places widely separated. Each island, although it might be separated from another by only a few miles, had its own distinct fauna, yet the birds, snakes, tortoises, iguanas, plants, all retained the same Galápagean pattern. Darwin found it 'immensely curious' that most of the indigenous inhabitants of the Galápagos Islands were found nowhere else, yet, distinct as they were, they all seemed to follow the American continental type of organization.

Why?

As impossible as it now seems, it must be remembered that in Darwin's time, and for that matter as recently as seventy-five years ago, animals were thought not to bear any relation to each other. All issued from the womb of Nature, fully born, with all their characteristics. They did not evolve from one another; they just were. A tiger was a tiger; it had never been anything else. The fossil of an extinct tiger was a species that God had created and when, in one of His sudden catastrophic tantrums, He had destroyed it, He buried it in the rocks and began again.

So what the Galápagos Islands displayed to Darwin, brought all the forces of his logic into action.

The archipelago was geologically recent, it had, in his mind, recently arisen from the sea ; it was separated from the mainland by only six hundred miles of water, yet so different were the creatures inhabiting the islands that they might have been a million miles away. Despite the uniqueness of the fauna, they retained the basic characteristics of the animals of South America. Now, there were only two ways to account for these resemblances and differences : either the tortoises, iguanas, birds, were 'created independently, simultaneously, or successively, or they were derived from a common ancestry.' If the animals were created separately, then the tortoises should, for example, duplicate their mainland counterparts, but they did not ; they were different species, and the species changed from island to island. If, on the contrary, all animals were descended from a common ancestry one could explain their presence on the Galápagos, because of some inexplicable faunal migration, and the fact that they differed from their continental prototypes. So, if the species found on the islands were not created especially for the islands, they must have been brought by wind, wave, or currents. If plant and animal species reached the Galápagos in this manner, why should they not have remained immutable ?

Well then, if the species were mutable and 'subject to modification,' one would find that the Galápagos species were peculiar to them, yet show more or less distinct relationship to those species on the mainland from which the Galápagos had originally received its species. This, then, was the solution. If it applied to species of the Galápagos Islands, then it applied to the whole world of living things. How blind he had been ! That was the answer. Geology proved it ; paleontology affirmed it, and before his eyes on the Galápagos the very tortoises carried the solution on the backs of their shells ; the finches in the shape of their beaks.

Walking among some of the most bizarre creatures of the earth, Darwin was struck by all this. Suddenly

the clarification came of the phenomena that he had seen. Gone was the parsonage; gone any lingering aspirations to retire to the country. Work was to be done and the path of science was the only one he would follow.

Darwin returned to England after his five-year voyage. He published his *Journal of the Voyage of the Beagle* in 1839. Busy in these efforts, he put aside for the moment his hypothesis of the origin of living things. The material he had collected on the Galápagos was given to specialists to examine; as curious as Darwin, they kept asking new questions about these particular collections.

The Galápagos Islands began to haunt him and he was relentlessly driven toward the final statement of the whole problem of organic evolution.

The change became evident in 1844. His publishers asked him to revise his *Journal of the Voyage of the Beagle*, and, in doing so, he radically changed parts of the Galápagos chapter. Gone were the hesitations; the principal points of his collecting there went home.

‘Aboriginal creations found nowhere else . . . differing from island to island . . . we are brought near to that great fact . . . the mystery of mysteries . . . the first appearance of beings on this earth . . . seeing this gradation of structure in one small intimately related group of birds (finches), one might really fancy that from an original paucity of birds in this archipelago, one species had been taken and modified for different ends. . . .’

Already the colour of his thought can be seen, ‘modified for different ends’; the investigations went on and always the Galápagos material lent him inspiration. Darwin was slow and methodical, the very antithesis of Herbert Spencer of whom Huxley once said: “Spencer would regard as a tragedy . . . the killing of a beautiful theory by an ugly fact.”

The *Origin of the Species* was published in 1859. The

rest is history. It cannot be said that without Darwin the theory of evolution would not have come into being ; but it can be insisted that had Darwin not taken the voyage on the *Beagle* to the Galápagos, it would have been seriously delayed. It is now quite obvious why the Galápagos Archipelago interests students of science, and why it has become necessary to protect the species from which Darwin was first led to formulate his theory of evolution.

That man's descent is as controversial a subject with anthropologists and zoologists as with Tennessee jurors, none will gainsay. No modern zoologist (and neither did Darwin, for that matter) thinks man was descended from the primate apes as we know them to-day, but all zoologists agree that ape and man have had common primate ancestors. Darwin is seldom read to-day even by zoologists, but the literature that has been directly and indirectly stimulated by the publication of the *Origin of the Species*, has reached thousands of volumes. One cannot hope to go through it in a lifetime. Despite the great advances of science since Darwin, the *Origin of the Species* remains a landmark in world thought. 'Of course,' as Mr. Geoffrey West, the recent biographer of Darwin, wrote, 'the *Origin of the Species* has its omissions, its reticences, its glosses, its limitations. It was written by man, not God. But it is by any standard a mighty product of the human mind. Question its validity, deny its truth and still it stands, a master-work, a synthesis of a whole section of knowledge, such as only a handful of beings have achieved in the history of the world.'¹

¹ The author wishes to gratefully acknowledge the kindness of Mr. Geoffrey West in allowing him to quote from his biography of *Charles Darwin* (Routledge, 1938), as well as to acknowledge the inspiration that this fine sensitive biography was in the writing of this chapter of Charles Darwin and the Galápagos.

CHAPTER XII

‘PORT OF CALL AND INDEFATIGABLE ISLAND’

WITH the morning, Chatham Island revealed itself to us. Wreck Bay was an open port with a dilapidated pier that extended from the beach a few hundred feet out into the bay. At the opening of Wreck Bay at low tide the masts of a large ship could still be seen. This was an Austrian cruiser, sunk during manœuvres in the waters of the Galápagos during the early days of the World War.

The first day was dull, the hills were shrouded by the *garua*. The beach was small and occupied by a few simple bamboo houses. There was nothing impressive about this part of the island.

In the early morning we disgorged our freight. In addition to our store of food, collecting apparatus, books, and instruments, we had to unload the bust of Darwin, for the monument was to be erected nearby. We also had to take off our two masons, natives of Guayaquil, who were to make a base. They had not come up on deck during the whole voyage; they looked positively gangrenous, but now that *terra firma* was at hand they took a new lease on life.

The whole of that day was spent trying to find a suitable place for the monument. I had designed a base which was to be made of the basalt lava fragments of the Galápagos; to assist the masons, I had also had made a small scale model. We had to have a supply of fresh water with which to mix the cement, and a block and tackle to lift the heavy bust of the naturalist on top of the pedestal when it was completed. To the right of the bay, overlooking the harbour, was an elevated spot near

the shore, which seemed to be the ideal location, and the site was decided upon therewith.

The masons were already at work on their task of finding the material for the base of the monument as we mounted mules and left for the settlement in the hills of Chatham Island. Half-way up the slope, at six hundred feet, the sun broke out through the mist, and the clear azure sweep of the Pacific revealed itself.

The ascent to the settlement was gradual. As it was September, the height of the dry season, the squat bushes were leafless and the whole island had an autumnal appearance. We saw that guava, introduced from the mainland (a fast-growing tree that produced a very edible fruit), was rapidly taking possession of the islands and was completely overrunning the indigenous vegetation.

Chatham Island, an elliptical island, twenty miles long and ten miles wide, has the topography, roughly, of the humps of a camel. The central hump, an extinct volcano, reaches an altitude of 2500 feet.

The English pirates called this central hump whither we were bound, Mount Morgan, after Henry Morgan the famous pirate. They called the island Mr. Philip Dassigney's Isle, and later it was renamed Lord Chatham's Island by Captain Colnett, who came here as an explorer of whaling grounds for the merchantment of London.

When the whole group was annexed by the Republic of Ecuador the official names of the islands, and the name of the archipelago itself, were changed again.

Chatham was renamed San Cristóbal, although few call it that now.

When we reached an altitude of 1500 feet the scene changed from leafless bushes of mesquite and acacia into a treeless savanna. We found a cluster of houses gathered on top of the savanna called 'Progreso.' The dwellings were as typical of Ecuador as were the inhabitants—swarthy, emaciated coastal types. An enormous corrugated-iron structure houses a sugar refinery. The machinery, dated 1913 and made in Scotland, was in excellent condition, although it was protected only by

the corrugated iron sheeting, loosely held together by wire and nails.

Basalt lava erodes into a fine soil, black and rich, and at 1500 feet altitude the island has a continuous supply of moisture, not only from the rains (which are ample), but from the *garua* as well. Once considerable quantities of sugar were produced here, but because the sugar cane was repeatedly planted without rotation of crops the soil became depleted. This, however, was of small concern to the original owner, Señor Manuel J. Cobos.

Señor Cobos was killed in 1906 in an uprising of the prison colony which furnished him with labour for the sugar mills. Since that time (and until last year) the Galápagos was no longer the Ecuadorian penal colony for criminal incorrigibles and political exiles. The island now supports three hundred inhabitants, all dependent on an organization in Guayaquil that has taken over the island, the boat, and the machinery from the late Cobos' son. For the most part the inhabitants lead a wretched existence, owing their livelihood to an organization which controls the food supply and the only ship, the schooner *San Cristóbal*. A military mission consisting of a colonel and a squad of soldiers, but with no vessel to command the great expanse of water, acts as the reigning authority.

We arranged for the *San Cristóbal* to drop us at Indefatigable Island, forty-two miles north-west of Chatham. We had seen nothing in Chatham that gave us the slightest desire to make this our base camp. My map showed that the island to which we were bound was in the centre of the archipelago, and I had heard that some Scandinavians lived there. The Comandante of Chatham said they lived *como puercos*, but experience had taught me that a Scandinavian peasant lived regally in comparison to an Ecuadorian one.

The erection of the base of the Darwin monument was left to the chief mason, and on the evening of the third day we left for the other island.

Indefatigable Island is the least known in the scientific records. Twenty-two miles in diameter, it rises at an incline of about twenty degrees to a centralized group of extinct craters, the highest altitude being 2610 feet.

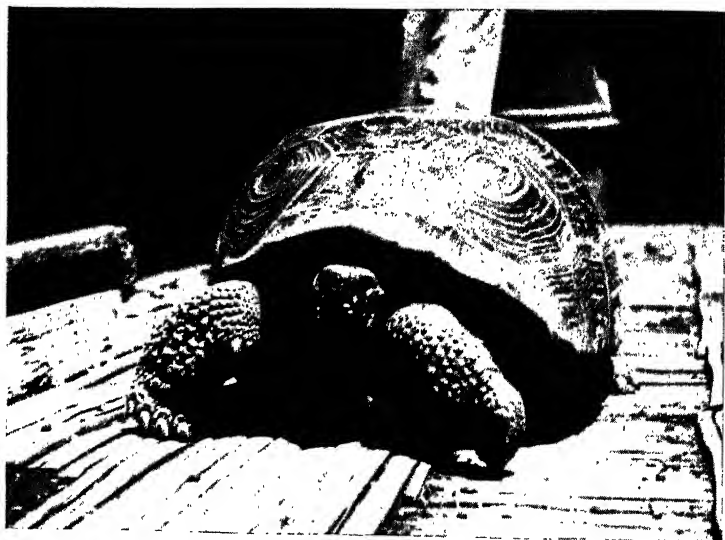
The zonal divisions of the Galápagos are very interesting, and doubly so on Indefatigable, for here they are sharply delineated. Alone of all the islands, it terminates in a central cone, or series of centrally located cones and, walking up from the seashore to the top, one has the best cross-section of the Galápagos region. The shore is precisely as it was described by Melville: 'Tangled thickets of wiry bushes, without fruit and without a name, springing up among deep fissures of calcined rock and treacherously masking them; or a parched growth of distorted cactus trees.' The perennial growth that lines the shore is predominantly small-leaved, xerophytic or desert plants, shrubs, wiry grasses, dwarfed by the immense cereus cactus, a grotesque arborescent species that rises as high as forty feet. Leave the coast, follow the path to a scant 300 feet altitude, and the change is most noticeable. The cactus remains but the trees are different; soil has appeared, moisture from the *garua* is perennial, and the trees are green the year around. At 650 feet altitude, the lava is covered by a rich, eroded soil, ferns and vines are present, and large-trunked trees fill the landscape. The growth of the trees is peculiar. Below two or three feet of soil the trunk strikes the hard lava and cannot penetrate. Having no support as it grows taller and thicker the tree falls to its side and the branches then come out of the uppermost side and so continue upward. All of the older trees have this dominant characteristic.

Although it is on the weather side of the island, the bay of Indefatigable is large enough and sufficiently protected by a small islet, Jensen Island, to make it safe anchorage even for larger boats. Access is had to land below a tall lava cliff that rises abruptly from the water's edge. A few well-made frame houses, constructed in the fashion of Scandinavian dwellings, are close to the



(Top) A YOUNG SEA IGUANA TWO WEEKS OLD COMES UP TO INSPECT THE NEW VISITORS

(Below) LARGE SEA IGUANAS PERCHED ON THE LAVA WALLS CLOSE TO THE SEA



(Top) A GALÁPAGOS TORTOISE FROM THE ISLAND OF INDEFATIGABLE

Note that it has worn off its nails on its left foot walking over the lava rocks of its home.

(Bottom) A GIANT GALÁPAGOS TORTOISE FROM THE ISLAND OF ALBEMARLE

beach, housing the survivors of the third and last unsuccessful colonization scheme of a Norwegian promoter. Here live Norwegians, Swedes, Danes, Germans, a sprinkling of Ecuadorians, and one Ice-lander. The whole number does not exceed twenty-five. We congratulated ourselves on this choice for a base camp. Two small ships rode at anchor within the harbour. The inhabitants in the main were pleasant, industrious folk. One gentleman, Mr. Rader, had the finest dwelling of all, a structure as comfortable as one could possibly find in an isolated place, complete with bath-tub. Mr. Rader had spent many years in the United States as a construction engineer, and had come to the islands with some well-conceived plans for starting a fishing industry, but the curse of the Galápagos put a quietus upon them. During our first moments together we sparred in Spanish and German, and then hit upon English as the best conversational medium.

We were installed that afternoon in a small empty house only large enough for our beds; the rest of our camp was placed behind a circular wall of lava stones that once served as a 'cage' for Galápagos tortoises. Under the trees we erected our camp. We knew more or less what the islands would yield in the matter of native foodstuffs, and our supplies were arranged accordingly. Water was the first and the one real problem. The islands have few sources of fresh water. The most available is on Chatham Island, where an extinct volcano has been turned into a reservoir. There is a waterfall on the weather side of the island, where fresh water pours tantalizingly into the sea, but few ships can reach it, and then only at great peril.

The only available water on Indefatigable comes from the *garua* and rain collected from the eaves of the roofs into barrels. Provided the colonists had sufficient barrels, there would be no lack of water, but of these there was a great lack. Mr. Rader kindly allowed us to have a barrel, from which we took our water, but still we were severely rationed. Dishes and clothes had to be

washed in brackish water carried from a source not far distant. Containing two per cent salt and a fairly high percentage of sulphur, it could be drunk for a little while, but not continuously. For the purpose to which we put it, however, it served admirably.

The Scandinavians occupied themselves with fishing and with farming their few acres on the heights of Indefatigable. The tragedy of this colony was the usual one of a 'promoted' organization. A step from our camp were two graves, mute evidence of the lot which had overtaken many members. The idea of a colony on the Galápagos was born when William Beebe's book, *Galápagos, World's End*, was translated into Norwegian. It certainly was no fault of Mr. Beebe's that Harry Randall, a promoter in Norway, saw in the island a Paradise and organized an agricultural colony. Each prospective colonist put two thousand kronen into the organization's coffers. Agricultural machinery was purchased, permission from the Ecuadorian Government secured, a boat purchased. On a September day in 1927 the colonists were unloaded at Wreck Bay. Lava surrounded them; of the acreage fit for agriculture, all but a mere portion was owned by the heirs of the late Señor Cobos. The colony disintegrated in two weeks.

Notwithstanding, another was launched, this time on Charles Island, south-west of Chatham. That one lasted six months. Still another scheme was launched before the Norwegian Government intervened. The last colony was the most intelligently planned. It was organized as a fishing colony, to can lobster and to prepare the tuna, which visit the Galápagos in sporadic schools. Fine houses were erected, canning machinery was brought in, contracts were made with the Ecuadorian Government to provide a good harbour at Indefatigable, a school-house, and a canning factory.

The Galápagos curse struck again after six months. The canning vat exploded and killed two men; the colonists quarrelled among themselves; there were desertions; they failed to keep their contracts made

with the Government of Ecuador (the Republic also failed to keep its agreement), the buildings were confiscated, and most of the colony departed, except a few who still clung to the hope that something could be done on the Enchanted Islands.

Periodically the ranks of the colonists have swelled and subsided as the venture has received publicity at home in Norway. A newspaper, remembering the colony, sends a reporter to write a few stories; he remains a few days and returns to write eloquent tales of the Galápagos, and each year more Scandinavians come out. Most of them return but some remain. Since 1927 they have explored the island quite thoroughly, and with their assistance our work was aided appreciably.

Mr. Finsen, the Iclander, was especially helpful. He was a keen observer and, for a man of sixty-five, a most industrious one. He had built in the humid section of the island a delightful little log cabin. With him as guide and mentor, I often spent many days collecting and wandering in the higher reaches of the island. He had a farm up there, where he grew corn, tobacco, bananas, coffee, cucumbers, and water-melons; but lest I should inadvertently, like Mr. William Beebe, bring colonists to this spot, let me say as warning that there are less than one hundred and fifty acres on the whole island fit for cultivation.

With Finsen, I left to climb to the top of Indefatigable. He was a small man with a broken nose, a full grey beard, and white hair beginning half-way back on his head, disclosing a fine rounded dome. He looked like the Great God Pan. His speech had no Scandinavian accents, but sounded more like a Scotch brogue. He had been on the islands for six years, having come with Mr. Rader from the oil-fields of Maracaibo. As we walked through the thick black mud, climbing to a small bare spot ahead, he said:

“A bit different than ye expected, eh? The Galápagos ‘Desert Islands’! I should like to get that fellow Melville by the ears and bring him up here. What did he

say again, 'they know not autumn and they know not spring' ? Why, I have seen it rain for six days straight ; just like it did this morning. Filled two big barrels in six hours."

"What about below, Finsen. The *garua* doesn't seem to supply enough water."

"Don't you believe it, that *garua* keeps the people alive down there. Take Rader's house ; they'll collect enough water from that heavy mist in six hours to last them two days. Wait a moment, let's drop in for Sorenson ; see if he will go with us. He's a geologist, ye know ; lived here for eight years. Came with the party of Norwegians some time ago, left and brought back a bride, an actress, mind ye, to live at the Galápagos."

A few minutes later we three were making for the top of Indefatigable. The humid regions, which support such luxuriant vegetation, gave way to the hardier type we had found on the *paramos* in Ecuador. The *garua* increased as we climbed, and running beside the muddy path was a brook of flowing water. I could hardly believe my eyes.

"Nice, isn't it ?" said Finsen. "But down it goes into the rocks, and comes out later by the sea. Now, if ye could tap it before it reaches the sea, ye could always have fresh water."

Just as in Ecuador the vegetation disappears at a certain elevation, so it does at the Galápagos. Instead of being cut off at 12,000 feet as in Ecuador, on Indefatigable Island it disappeared at 1600 feet, only coarse ferns and small, delicately flowered bushes remained. Extinct craters were everywhere with trees growing in their depths. Wherever the heavy south wind struck, the plants were small, tough, and coarse. The temperature was fifty-nine degrees ; I was chilled to the bone, and this was on islands on the Equator in October at only 1600 feet altitude.

"This path looks well used, Finsen," I remarked, "what in the world can you find up here at this place ?"

"Why, we come up here during the drought; sometimes in the dry season, that is between April and August, the water gives out below and the men have to come up with donkeys and carry down the water from 'ere in barrels. Over the top of the mountains and down on the other side toward Conway Bay there is an old plantation. We go there to get bananas, yuca, and sugar-cane. Who put it there? No one knows. Been there so long that some people think that the pirates put it there. Not a sign of a house. Termites have eaten all the wood. Sugar-cane, yuca, and bananas need no hand to plant them; looks like they've been there, wild, for centuries."

I asked the geologist, Sorenson, if there was a central crater on Indefatigable, as was displayed on the maps.

"No, there is no central cone; we are standing at the highest level, which is two thousand six hundred and ten feet by my aneroid. You can see that there are a series of deep craters, most of them covered over by the eroded soil."

"How old, geologically, are the Galápagos Islands?" I asked.

"Who can say? The islands are purely volcanic; there is little about them to reveal age. You need other types of rocks for that. I have seen, on the east coast of Indefatigable, some rock, not precisely volcanic, which I have ascribed to the Pliocene. That, as you know, is the earliest period of the Tertiary Epoch, some sixty million years ago."

"Sixty million years ago! I thought the Galápagos were very recent."

"So they are, geologically speaking. I don't believe that they were connected at all with the continent. I have William Beebe's book in my library. He shows the Galápagos neatly connected with the island of Cocos, which is two hundred miles off the coast of Costa Rica. He has in nice detail a great plateau, and the Galápagos as the high mountains of this submerged continental arm. Stuff and nonsense! That water is two thousand

fathoms deep, mind you, twelve thousand feet, and no expedition has systematically carried out soundings to prove there was such a plateau. Now, you take some recent geologists, I mean the men that have crawled about the rocks like I have. There is a man named Chubb, came here on the Saint George Expedition. He says the composition of the rocks of Galápagos shows great affinity to the rocks of Juan Fernández, far down south off the coast of Chile, and even to the Marquesas in the Pacific. Darwin believed, and I think he was right, that the Galápagos rose from the bottom of the sea, that, by successive outpourings of lava, they rose finally above the sea, and in some cases, like Albemarle Island, the high volcanoes eventually coalesced to form one island."

"And you don't think there was any subsidence in the Galápagos?"

"No, I don't. On the contrary, the Galápagos show elevation, if anything. Oh, there might have been some local subsiding and breaking down of the craters, due to the action of the sea, but nothing general. Take Academy Bay there below; that is nothing but the mouth of a crater broken at one end from the action of the sea."

"I think I agree with you, Sorenson. Land bridges are such convenient things to erect when you can't explain, or do not possess the facts to explain, the migration of animals. Now, the termites are my particular speciality. On the Galápagos there are only two genera, and these are the types that could only have been brought by the currents, drifting inside a piece of wood. They do not need moisture or contact with the earth; all the other species on the continent need such contact and could not have survived the long days it took to get here. The same conclusion is true of the ants. Yet neither the theory of former land connection nor the theory of their pelagic origin adequately explains the fauna here."

Finsen cut in: "Well, you two can stand here and

talk geology if you want to, but I’m soaked to the skin from this *garua*. Let’s go down and have a cup of coffee. I’ve promised the doctor here that I’d take him to the tortoise place to-morrow.”

So down we went, wallowing through the mud and slush of the top of Indefatigable to the log cabin of Finsen, where the coffee-pot was simmering over the fire. A Scandinavian’s pipe and his coffee-pot are his inveterate companions.

CHAPTER XIII

THE GALÁPAGOS TORTOISE

A FEW hours' walk from Finsen's house, through tall thorned bushes fringed with cactus, is one habitat of the Indefatigable Island tortoise. The region is about 650 feet in altitude. There is some eroded soil, and the giant cereus cactus is bountifully distributed. Long, jagged spurs of lava, covered with green lichen, break up the level ground. Since I had not expected to see tortoises swarming over the land as they once did, I was not disappointed that our first hour's search went unrewarded. Toward afternoon, Finsen stopped to pick up a *fæces* that I thought came from a mule (for there are wild mules on the island), but he examined it and said it was tortoise dung. Later on we came to small trees that were broken off about two and a half feet from the ground. Finsen examined the bushes. "Look here, doctor, see this—a galápagos's trail. This is a big one, you see the trees broken right off. That's about the height of this galápagos's shell from the ground. Makes right for where he is going and knocks down everything he comes to in his way. We'll catch up with him soon—these broken trees are fresh."

At dusk we did catch up to him. In a cleared spot under a tree, a gigantic tortoise lay. Its shell must have been four feet in length and lay flat on the ground; the neck of the tortoise was outstretched from the shell as well as its four legs. I thought it dead, and said so.

"Dead!" echoed Finsen, "not a bit of it. He's sleepin'; that's the way he sleeps."

As we came near I accidentally kicked a small stone which rolled up to the tortoise. Instantly it snorted and

pulled its neck and legs into the shell. We waited. Slowly, the long neck came out of the shell. It kept coming out, until it had reached out a full two feet. The legs emerged and clumsily the animal lifted itself to a standing position. Slowly, like an automaton, the head turned about, the large eyes looking dully into space. It looked at us (we were only two yards distant), but there was no evidence that it perceived us. The head turned around again, and as slowly as it rose the tortoise sank down until the shell rested on the ground again with the neck out and the feet exposed. Deliberately, it went to sleep. Finsen pulled my arm: "Leave him be. He won't move until morning. It's getting dark now—can't see anything anyway. We'll put our camp here and to-morrow you can see them."

In the light of our fire that night, Finsen and I exchanged experiences, but I was more interested in his observations of the tortoises than I was in anything else that he told me. I expressed a wish to live up here for awhile and follow the life-cycle of the tortoises. We decided that in the morning we should make a shelter, a more permanent one than that we had constructed for the night.

During the next weeks I became the biographer of the gigantic land tortoises of the islands. Everyone who has ever seen them has been amazed at their great size, but no naturalist had settled down to observe their life-cycle. Chance, furthered by my own interest, presented me with the opportunity to do this very thing. After all, the islands received their name from the tortoises.

During the Tertiary times, some sixty million years ago, the Chelonian type of tortoise was well-distributed in the northern hemisphere. Their fossils are found in our South-west, in Patagonia, in the Island of Cuba. There is a mounted specimen of a giant fossil tortoise in the American Museum of Natural History which, when it was alive, weighed approximately 2100 pounds! America is the home of the earliest known land tortoise, and curiously the great fossil from India most closely

resembles the extinct American species. At one time, in the age of reptiles, immense tortoises existed everywhere. Rapacious mammals then appeared and, later, man. Faced by these two competitors the giant tortoises rapidly disappeared. After millions of years of existence they became extinct except on two places of the globe: the islands of the Aladaran group (Seychelles, Reunion, Mauritius) in the Indian Ocean, and the Galápagos Islands. Both island groups are remote from the mainland and were unknown to mammal and man. The land tortoises cannot swim at all effectively but they can remain alive for months without food or water and they can float with their long necks stretched high, because of the compact shell they are exceedingly buoyant. They can even paddle with their front legs in an emergency. But the two island groups are far out from land and one can hardly say that the tortoises, aware of such islands, made for them purposely. There must be some satisfactory way to explain the presence of these tortoises on islands hundreds of miles off the mainland. What would be true of islands in the Indian Ocean would also apply to the Galápagos.

In the weeks that I spent watching the tortoises on Indefatigable, and the six months that I was on the islands, I was able to observe their habits from egg to maturity and I can spare other students the difficulties, the long hours of climbing over lava rocks, in trailing the tortoise to find out where they go and why.

Let us begin with the first entity, the egg. Anywhere between 100 to 500 feet altitude the eggs of the galápagos are buried fifteen inches below the dry, rubble-like soil. Eight to twenty eggs, the size of white billiard-balls, occupy the cache. After about two months of incubation the tortoise breaks the egg and attempts to emerge from its hypogeum. The little tortoise is rolled up like a jelly-roll within the shell, its small head bent over until it touches its tail. The shell is soft, and etched on it is a design of thirteen symmetrical, five-sided plates. It weighs only two ounces and is scarcely more than two

nches in length of the shell. The little tortoise begins to dig itself out of the nest. The ground is loose below, but its progress upward is stopped by the hard earth crust, which the mother tortoise packed down after she laid the egg-cache. It must be remembered that the young tortoise is extremely delicate, the shell is not yet hardened; to push aside hard-packed earth is herculean labour for the newly hatched tortoise. I found egg-caches where some of the young tortoises escaped from the eggs, but died before they could get out of the hole. The tortoises on the bottom have the most difficulty. The age-old struggle for existence is fully exemplified in this microcosm of the tortoise-world.

When it is free of the hypogeum, the minuscule tortoise walks about dragging a tough egg-yolk sac, about the size of a half-dollar, which adheres to the ventral or under-side of its shell. It is attached like a placenta. The young tortoise drags this about until it has absorbed the whole into its body. I believe that it does not eat other food so long as the placenta is being absorbed, which takes from six to ten days. Then the ventral portions of the soft plastron close and the tortoise is ready to begin its real life cycle. At this time it weighs not more than $2\frac{1}{2}$ ounces; full grown, Galápagos tortoises have actually been found to be heavier than 500 pounds! Picture the difference, the disparagement between 2 ounces and 500 pounds! No complex animal exists that exhibits such a tremendous increase in size, an increase of 4000 times the original weight.

The tortoise begins by eating the coarse grass near its birthplace and, when they can be found, succulent pieces of cactus-pads that have dropped from the cactus trees. At this stage of its life the little tortoise could be placed in a mill-pond anywhere and taken for a typical North American land tortoise. In two years it loses its flatness; the shell, on the Indefatigable species at least, begins to grow high and vaulted, highly concave, so that the measurement across the shell is as much as its length. In the first years of its growth it appears to

develop remarkably fast, as much as two inches a year. No one has ever followed this growth in the tortoise's own habitat ; the only records that exist are those kept in the zoological gardens, and these records vary because of the superfluity of food in the zoos. In the Galápagos Islands it is different. Growth is strictly limited by scarcity or abundance of food.

Before man came to the Galápagos the little tortoise had not an enemy in the whole island except its own clumsiness. Man introduced pigs, dogs, cats, rats, goats, and mules. To-day the tortoise must run the gamut of all these to survive. If it does, it continues to develop fairly rapidly until it is twenty-five years old, and then the rate of growth is slowed down to a meagre half-inch a year. Its growth is curious. The plastron or shell of the tortoise is not wholly solid. It is covered with hard, symmetrical, bone-like plates separated by nerve-centres ; at certain times of the year the nerve-centres become white and then one whole horny plate drops out. Underneath the detached plate is a new one. Then, on the other side of the shell, another plate drops out and is replaced by a new one. Each time this 'moult' takes place, the new plate adds a centimetre in size. Such is the rate of growth of the tortoise, with the hard plastron beneath the skin-like plates keeping pace with the growth on the shell's surface.

There are three diurnal phases to the tortoise's life. It awakens at dawn and begins to search for food. If it happens to be on the lower slopes of the volcanic islands it browses on cactus-pads. Composed of eighty per cent of water, cactus has, none the less, a fairly high nutritive content in starch and sugar ; from it the tortoise gets both water and food. If the tortoise is on the higher zones of the islands it browses on the green moss which covers the trees, or on the coarse grass. At noon, when it is warm, the tortoise retires for a siesta under the shade of the trees. Later in the afternoon it awakens again to eat until dusk, when it seeks out some dry spot upon which to sleep. No sooner is it dark

than it is asleep; it does not, and will not, move far at night.

During the year, depending on the extent of the droughts (for those come sporadically to the Galápagos), there are numerous vertical migrations to the highest point of the islands. On some of the higher islands such as James, Indefatigable, Albemarle, and Narborough, water gathers in extinct volcanic vents during the rainy season, and the tortoises come up there to drink. They plunge directly into the water and drop their heads under the surface, completely submerge, in fact, and gulp in the water. The liquid that is not absorbed into the system at once is stored in a great reservoir sac which rests on the lower part of the shell, within the carapace. This reserve is kept for those times when a great drought occurs in the islands. The early visitors to the Galápagos, whalers and pirates, soon learned of this water sac. They would cut open the tortoise and drink the water; the taste is slightly acrid, but that is of little importance when one is suffering from thirst. Darwin found that the vertical migrations to the top of the mountain were so frequent that the tortoises had worn smooth the lava rocks over which they dragged their mammoth carapaces. They will also knock over trees or bushes which block their progress.

The utter monotony of this huge reptile's passage through life is broken only by the migrations that accompany the mating season. Testudinal or tortoise-love is very curious.

It was in January, and I was covering the last part of the biological biography of the galápagos. I heard a cracking of trees behind me and was bewildered to see a huge male galápagos rapidly coming toward me. Ordinarily they travel slowly and deliberately, approximately sixty yards in ten minutes. This one was obviously 'going places.' Its neck was fully extended; its usually vacant, staring eyes were now full and glistening. In the corner of the eye was a white froth-like substance. It made straight for me. I moved some yards to the

left, and it changed its direction with mine. Its mouth was agape, its neck craned forward. The pouch under its neck pulsed in throbbing expansions and contractions. For a moment I considered beating a hasty retreat. To have coming toward you a charging reptile of three hundred pounds, standing two and a half feet off the ground, is an alarming sensation. Suddenly, from its throat issued a deep bellow, a fog-horn effect. And then I understood the meaning of this strange performance—the huge tortoise was animated by ‘love’ and imperfect as its eyesight was, it thought from a distance that I was a tortoise. Not a very flattering tribute to my appearance!

When it came near to me, it suddenly realized its mistake and recoiled, dropping flat on the ground like a balloon that has been pricked. But the mating instinct of the male tortoise could not be put aside so easily; as swiftly as it recoiled into its shell, it rose up and moved forward again, the neck extended, its movement considerably quickened.

The few short weeks of the mating season is the one period in its life cycle when the male tortoise loses its lethargy. I saw two male tortoises engaged in fighting one another; they bite at each other’s shells, and try to overturn each other. Amidst great groaning, the pushing goes on apace as the clumsy leviathans churn the earth. Darkness, alone, ends their struggles. The males are struggling, not for one female, but whole areas of females for, like the sea iguanas and the land iguanas of the Galápagos, the tortoise is polygamous. This I learned when I had a number of females and a male galápagos in captivity during the mating season, and the male gave equal and repeated attention to all the females. ‘In love, in mating,’ as De Gourmont has it, ‘everything is just; everything is noble, as soon as among the maddest animals, it is a play moved by the desire of creating.’

The male tortoise carries on his mating over a wide range of territory. I do not know the ratio of the sexes,

for the dimorphism between them is so slight that one cannot instantly tell male from female. Once the female is fecundated (the mating season draws to an end some time in April), the eggs usually take four months to incubate, although in comparing my notes with the other naturalists who have investigated the phenomena I see that the time differs from island to island.

On Indefatigable Island, between the months of October and January, the female swollen with eggs moves toward the lower arid regions of the island and searches for a place to lay her eggs. With her long-nailed front claws she scrapes at the ground, excavating until she finds a place with sufficiently eroded loose soil. Painfully, laboriously, she hollows out a hole, turns about, squats and expels the eggs into the hole. The soil is scraped back into place over the egg-cache, and the female then stamps with all her weight on the loosened earth, packing it solidly. Natives on the islands insist that the female purposely puts its excrement on top of the egg-cache, stamping it down to create a cement-like surface.

At present, the galápago is extinct on a number of the islands. On Charles and Chatham Islands they are definitely extinct. The tortoises of Barrington Island have never been seen by any naturalist, although fossil eggs and bones were found by an expedition from the California Academy of Sciences in 1906. On James and Duncan Islands they are very close to extinction. The small island of Jervis has produced but one single specimen (and, I think, an apocryphal species) to the collectors. Abingdon, sixty miles northward from the whole archipelago, has only a few left. Only on Indefatigable and Albemarle, the two largest islands, do the tortoises exist in any number. Before the advent of man, they existed in millions. Dampier, the pirate, speaks of the 'land turtles [as being] so numerous that 500 to 600 men might subsist on them alone for several months without any sort of other provision. They are so extraordinarily sweet that no pullets eat more pleasantly.'

Every ship cruising in the Pacific during this time stopped for its quota of tortoises. It was the whaling era that began the fearful havoc among the galápagos. Dr. Townsend of the New York Aquarium estimates, after a perusal of whalers' log-books, the number of galápagos taken from the islands by the whalers in thirty years as exceeding 200,000. No one knows how many had been removed before that time. After 1850 every whaler that went into the Pacific stopped at the Galápagos for tortoises; on one of these boats, the *Acushnet*, was a young sailor named Herman Melville. He was sent ashore off the tip of Albemarle for tortoises. He writes in the *Encantadas* of seeing the men bring some of the species aboard the *Acushnet*:

'These mystic creatures, suddenly translated by night from unutterable solitudes to our peopled deck, affected me in a manner not easy to unfold. They seemed newly crawled forth from beneath the foundations of the world. Yea, they seemed the identical tortoises whereon the Hindu plants this total sphere. With a lantern I inspected them more closely. Such worshipful venerableness of aspect! Such furry greenness mantling the rude peelings and healing the fissures of their shattered shells. I no more saw three tortoises. They expanded, became transfigured. I seemed to see three Roman Coliseums in magnificent decay.'



BIZARRE OPUNTIA CACTUS GROWING OUT OF PURE
LAVA AT ALBEMARLE ISLAND



Courtesy: Pinchot expeditions

(Top) AN IMMENSE LAND IGUANA FROM SEYMOUR
ISLAND

(Bottom) SEA IGUANAS AND TWO ALBATROSS

CHAPTER XIV

THE 'SALLY LIGHTFOOTS' AND SEA IGUANAS

IN clattering red armies, over the black basalt lava shores of the Galápagos Islands, the 'Sally Lightfoot' crabs play their small part in the daily zoological drama of this volcanic archipelago. This small, fiery red, agile crab is the most abundant and conspicuous member of the Galápagos fauna. It is the scientist's *Graspus graspus*, more conveniently and perhaps more poetically known as 'Sally Lightfoot.' And surely it is no misnomer to call this crab 'Lightfoot,' for its antics are ballet-like; it moves forwards, backwards, and even sideways, or all three ways at once, as its eight legs are moved by the delicate organisms within the thin red shell. And as for its place in this great zoological cosmogony, its peculiar niche is that of an intermediate stage in the scale of vertebrate creatures of the sea and land.

In the daily struggle to eat and not be eaten which prevails in all animal life, the crab's only defence against its mortal enemy, the bittern, is its spectacular dash for safety among the rocks, and often this avails nothing. The bittern, a powder-blue shore bird, is wonderfully quick with its strong short beak. Its tactics are stealth and an amazingly rapid terminus to the stalk. The bittern leaves, as evidence of his successes, dry empty shells on the Galápagos shores. But the bird's stalking is not always crowned with success. The drama of the bittern and the crab is repeated with monotonous regularity and one may witness it most any time on the shore of the islands.

The bittern, singling out one victim among the host of crabs that covers the rocks, poises in his hunt as if

frozen; he fixes his eyes on his prospective meal and moves slowly forward. The crab, equally wary, retreats, but in a manner barely perceptible. While staring at the bittern, the crab, with its two periscopic eyes raised in crustacean horror, seeks by means of its eight legs to get a sure hold on the rock crags. When one set of legs is secure it grasps another prong and retreats still farther toward ultimate safety. The bittern recovers this advantage by crouching low and moving forward to take up the distance that the crab has made by his movements. Neither antagonist seems desirous of watching the other in movement. This play will continue for as long as thirty minutes. In a flash the crab, perceiving that his legs have enough leverage to fling his body backward, releases his other legs and sends his body down into a dark crevice. The bittern, seeing the sudden movement, strikes and misses. The crab, in his secure place in the lava-rock fissures, looks out upon his enemy with the cold eye of the crustacean. The powder-blue bittern raises his crest in anger—to have waited that length of time for a meal that never is begun! He then sulks away to other fields.

At midday, at the height of the tropical heat and when dangers are least, a whole red army of 'Sally Lightfoots' sweeps across the rocks in a meridional fantasy. Here and there, two of equal size pair off and set to like a couple of boxers, and so, indeed, do they appear. Each dangles in front a pair of pincers not unlike boxing-gloves, and the play-boys wave these at each other, spar, feint, and dance away in a perfect mimicry of the manly art of modified murder. At times they clash and then retreat in the general movement of life at play. It is a form of crustacean sport that seldom ends in fatality. True, one entire pincer sometimes becomes loosened in the struggle and the wounded battler, realizing his handicap, figuratively throws in the towel and scampers away, leaving his detached weapon on the shore, but bountiful Mother Nature will soon grow him another.

In front of our camp was the open sea ; to the left, the shore, where tumbled, black basalt blocks formed the beach, extending around the whole island. The inhabitants of these lava blocks are the sea iguanas. A short walk from our camp over the stones there would raise up before you myriads of small black marine iguanas. This sea iguana, *Amblyrhynchus cristatus*, is the only amphibious iguana in the world. It is found on almost all the islands, but more abundantly on the larger ones. Barrington, Duncan, Jervis, and Abingdon have a small quota.

The little fellows, as black as the lava stones on which they rest, would scurry like autumnal leaves before a freshet and, poising after their dash, would look askance at the two-legged monster that disturbed their reveries. They would poise with heads in air, and eye us with a fine reptilian disdain. Their dark intelligent eyes would watch our every movement, and often like a dog or bird they would tilt their heads to left and right to understand more clearly the sounds about them. They are most gregarious, sitting on the rocks in countless hundreds. Since they are vegetarians living on plants of the sea, there is no bickering among them, no struggle for animal food. Small iguanas would run about the bodies and heads of the larger males, and the oldsters would not 'bat' an iguana eyelash, as the small tails swished by them.

The larger, yellowish, orange-spotted and black males usually rest during the heat of day among the salt-water succulents that line the shore. If we walked among these plants during the afternoon, we would most likely tread upon the iguanas hiding there. Christine would give a short scream when one, larger than the rest, would rise in front of us and dash for the safety of the rocks. These larger ones measured from forty to sixty inches in length overall. They will not bite when handled and also will not live in captivity. The old males are, in a sense, repulsive. They are given to a vigorous shaking of their heads, like palsied old gentlemen. They

looked as if they were daring us two-legged monsters to keep our peace and theirs. The head shakes threateningly; the mouth opens, showing the range of sharp coral-like teeth; the soft, reddish tongue protrudes. It looks very fierce. But if you advance a step, the mouth closes, he becomes alert, the fierce mien fades; another step, and off he goes, dragging his tail behind him. Being the only lizard that is known to live solely on sea-algæ, the sea iguana may be considered as representing, in a manner, the pliosaurus of ancient times. These stocky, sullen-visaged creatures reminded me of the age of monsters when reptiles peopled the earth. They had neither enemies nor competitors and their histories have been told by their fossil remains. Through some cataclysmic change, they perished so rapidly that few of the species were able to adapt themselves to the new conditions. Dying in various media that did not always preserve their remains, they left for posterity a few species, on a diminutive scale, to wander in a lost world. Of such ancestry are the sea iguanas of the Galápagos Islands.

During the months of November to February, the female places her fertilized eggs in the sand, a little above the high-tide level. Burrows are tunnelled into the sandy slopes to about the length of an arm, reaching a maximum depth of twenty inches. A half-dozen eggs or so are laid by the female. The eggs have a tough, pliable shell averaging about 140 mm. in circumference, 76 mm. in length. Hatching in a relatively short period, the little iguanas make their way out of their sandy incubator, and take their place among the gregarious sea iguanas perched on the lava rocks. Their stomachs are so fashioned that almost at once they browse on the sea-algæ on the rocks that are uncovered during the ebb-tide. This they nibble with their curiously shaped teeth. Dainty, closely allied, they are shaped with monotonous regularity throughout the whole curve of the upper and lower jaws.

It was Darwin's observation that the iguana will not enter the water voluntarily if pursued to the water's

edge, and will return to the same spot from which it is tossed into the water. Others have gainsaid this observation. Our experience might be stated as follows: The larger iguanas, the heavy crested males, will enter the water when pressed, and will swim out toward sea to some rocky islet, or to any other convenient place nearby. The smaller iguanas will not enter the sea, no matter how pressing the situation, and will attempt at the last moment to elude the pursuer by slipping within the rocks. They will even allow themselves to be caught before entering the water voluntarily, so convenient an escape for them. Why? Because some danger lurks there for them. This is obvious, for if the smaller iguanas are thrown into the sea, they swim to shore at once as if a whole school of sharks were after them. The older iguanas are powerful swimmers above or below the water, and they enter the water and make their egress with a seemingly studied leisure.

Swimming is done with the tail alone. It is a long, broad instrument of propulsion, longer than the body of the iguana itself, and spined from the tip of the tail to the base. There is, in fact, a continuous line of spines from tail to nose. When swimming, the iguana adopts the latest methods of stream-lining: the legs, front and back, are clamped to its side, and the tail gives long side swishes, like the single paddle of Neapolitan boatmen. Strangely enough, the hind feet are webbed between the third and fourth toes. As the feet are not used for swimming, this is a curious aberration.

Curious, too, are the male encounters leading up to the consummation of the nuptials. To see the iguanas rocking back and forth, fighting over a female, recalled me to antediluvian times. Dinosaurs, pliosaurs, triceratops might have fought for their mates just as these males were doing now. To add to the illusion, we lay partially hidden behind the rocks, and watched the iguana love duel. It made the beasts look even larger than they actually were.

The heads of the iguanas are entirely covered with large pyramidal shaped spines. Placed head on, the two males keep pushing each other back and forth ; they snort and hiss, and the sand whirls about them. The pushing becomes so hard that blood begins to run from the mouth of one of the iguanas. Time is declared and the slightly bleeding victim rubs the sides of his face on the rocks. The other lies on his belly in the sand, shaking his head with a curious swelling of the pouch in his throat. Suddenly they set to again, and look like two bucks fighting to possess a female. As the iguanas exist in groups of hundreds, females cannot be scarce. The fight for a female may be one of those sexual atavisms, a holdover from the time when the iguana was not gregarious, and females were relatively scarce. But animal and man alike retain many gestures which, once expedient, are now ludicrous.

CHAPTER XV

BARRINGTON ISLAND

EVERY evening the sinking sun painted the peaks of Barrington Island that was directly in front of our camp at Academy Bay not more than ten miles distant. November approached and the sea of the Galápagos Archipelago was losing some of its autumnal fierceness. Estampa, one of the Norwegians, now was ready to take to the sea to fish. He had a fine Norwegian fishing-boat with sail and a motor which he had been given by Mr. Kermit Roosevelt when the latter paid a visit to the island with Mr. Vincent Astor. I had brought with me some petrol and we made arrangements with Estampa to accompany him on a fishing trip to Barrington. Estampa knew the Galápagos Islands as few know them. For ten years he had cruised everywhere in his small boat. He was a blond-haired, blue-eyed Scandinavian, very capable and with a fine homespun pleasantness. Our servant, Truviño, made up the party of four. We filled our water-casks and at daybreak one morning started out for Barrington.

This island, the largest of the lesser isles of the archipelago (named after Sir Samuel Barrington, nineteenth-century English Admiral), lies almost half-way between Chatham and Indefatigable. Its tortoise fauna was extinct perhaps earlier than those of either Chatham or Charles. Naturalists can only surmise the presence of tortoises from reports, for none has seen a living galápagos on Barrington. Instead, a great herd of goats swarms over the island where they obligingly have made definite roads and cut a path up the first steep cliff, the only real ascent in the whole island. One can make the climb in fifteen minutes.

As Barrington is so close to Indefatigable, one might deduce that there would be many similarities, but generalizations concerning the Galápagos are almost always misleading. Nothing about Barrington, not even its superficial geologic conditions, bears the faintest resemblance to Indefatigable. Geologically, Barrington seems to have passed through fewer degrees of volcanic activity. I saw no extinct craters. Beneath whole layers of solid lava and volcanic ash are areas of volcanically eroded basalt, with red layers of an undetermined geologic stuff. Erosion has taken place rapidly, so much so that the land iguanas are able to dig deep holes into the red porous soil. Thus, in spite of the facts of Barrington's low altitude, slight humidity, and little rain, the erosion appears to have occurred in proportion with erosion on the larger isles having great precipitation. Either Barrington is geologically older and has had time to acquire eroded soil, or the volcanic activity has been less.

There are three dominant floral forms, which seem to be present on all the islands: the cactus (which on Barrington is very stately), dwarf mayuyu and the *palo santo*. Ecologically the island differs little from sea-level to the higher veldts, the same vegetation appearing at the shore rocks as is found at the highest point. On the coast, surrounding the small bay, are the usual salt water succulents, but no mangroves, and, therefore, no mosquitoes. Rains fall heavily during the rainy seasons. Large dry 'river' beds, ten to fifteen feet wide, the waterways of the rainy season attest to the heavy torrents that gather on the island during the tropical squalls. The largest water-path runs along a level surface to a point five hundred feet from the sea where it suddenly plunges underground and sweeps into the harbour from a subterranean exit.

In its six miles length, Barrington offers to the traveller the most pleasant of terrains in the whole group of islands. The tallest peak is 900 feet, the average altitude not over 400 feet above the sea. Moved ten miles

to the south-east, Barrington would occupy a central point between the islands, Hood, Charles, Chatham, and Indefatigable. Here is to be found the only land-locked harbour in the centre archipelago, but available only for boats of small draught. Fifteen hundred feet in length, half of that measure in width, Barrington harbour is securely land-locked with various depths of one, three, four and six fathoms throughout the bay.

At the end of the harbour there are two large seal rookeries. In addition, the harbour has the usual sea turtles, giant sharks, pelicans, and boobies. There are said to be a few sea iguanas, though in our three visits there during the time we were at the Galápagos, we did not see any evidence of the semi-amphibious *Amblyrhincus*. But there is a unique specimen on the island: the pallid *Conolophus*, a distinct species of land iguana.

The land iguana is distinct from the sea iguana; it cannot swim; its tail is shorter and more rounded; it lacks the spines of the other. Its head is longer and wider; the terminus or the snout of the reptile is rather pointed, and the body is heavier. It lives in deep holes that it hollows out in the loose soil by means of its heavy claws. There is only one exit to these cavern nests. There are so many of these caverns that as you walk about the island, you will suddenly feel the earth give way and you plunge into a nest of the lizards. At dusk on dull, misty days, they remain below in their nest; as soon as the sun's warm rays have penetrated their homes, they crawl slowly up to the surface and lie in the sun's rays, still numbed by the chill of the night.

When their bodies are animated by the warmth of Old Sol, they start to browse on the cactus pads that have dropped from the bizarre Galápagos cactus 'tree.' With rare exceptions the cactus forms their only food; from it come both water and nutriment. They first scrape the more obtrusive thorns from the cactus with their claws, and then with little more ado clamp their jaws down on an ample portion. Thereupon the head is thrown

back and the throat muscles precipitate the aliment into the stomach. The tongue, a soft reddish organ, comes out of the side of the mouth and is either engaged in extracting water from the cactus by pushing it to the top of the mouth, or is merely getting out of the way of this thorned morsel.

The iguanas and their distribution ranks as one of the most interesting of the Galápagos fauna puzzles. Darwin himself remarked that nowhere in the world, save at the Galápagos, would one find so well characterized the species, 'as the *Conolophus* and *Amblyrhincus*, a genus having its terrestrial and marine species belonging to so confined a portion of the world.' It is forever to be regretted that Darwin had not the opportunity of visiting all the various islands where Galápagos land iguanas are found. He saw them only on Albemarle and James, for the *Beagle*, in its five weeks in the Galápagos, touched only six islands¹ of the archipelago. The Galápagos land iguanas are found on six of the islands of the group. There are two species; those of South Seymour, Albemarle and James belonging to *Conolophus subcristatus*. At Indefatigable we found a new colony which may prove to be a distinct variation of the genus *subcristatus*. The difference between the two species of land iguanas seems to be merely one of colouring. In habits and general mannerisms at least, they are identical.

At present it is unknown whether the two distinct genera of marine and terrestrial iguanas 'arrived' at the Galápagos already clearly and definitely characterized, or whether the land iguana evolved from the sea iguana. For the sea iguana is a powerful swimmer, and in view of this fact, its distribution on most of the islands is understandable. The land iguana, on the other hand, cannot swim. When I placed them in water their first attempt was to move their four legs, paddling like dogs. In a few minutes they ceased to move and allowed themselves to float on the water. When finally

¹ Hood, Chatham, Charles, James, Albemarle, Abingdon (in the order named).

brought on board ship the water ran from their mouths in streams, showing that they do not have the ability of breathing under water as the sea iguana does. Yet their habitats are on points of land in the Galápagos where the general currents of the Galápagos sea might have carried them.

It is, to use Darwin's words, 'eminently curious' that these volcanic cinder heaps should have been the last refuge of the diminutive descendants of the extinct iguanid Mesozoic reptiles.

The land iguana is not so *gemütlich* as the sea iguana. It is not wantonly vicious, but it will bite. And whoever has felt these powerful jaws close on his hand will respect those jaws thereafter and keep clear of them. Yet correctly handled (by the tail) the animals are harmless. Capturing them is rare sport. The pallid land iguana of Barrington has been badly persecuted. It is the custom for the native fishermen to kill a few in passing, for they are highly esteemed as food, being a cross, as it were, between chicken and fish. Like many hunted creatures, the land iguana is wary. It will allow you to approach within a few yards and then it is off. Our native servant, Truviño, was an old hand. Shod with sandals made from an old automobile tyre, he kept after the iguana, never slackening a moment, keeping as close to the tail as possible. Up the hills, through thorn-bushes, under cactus trees, the chase went on. The iguana would seek a hole, a fissure wherein it might take refuge; the pursuer would keep so close to him that the big iguana never had a chance to make up its mind to turn into a crevice, but kept up its flight. Eventually, the reptile would stop and turn in its tracks. With heaving sides and mouth open, it defied capture. Here I saw real 'blood in the eye,' formerly merely a figure of speech to me. The eyes of this cornered land iguana were blood red instead of the natural colour, light grey, so red that I thought any moment to see blood ejected, as is said of the Arizona spined lizard. Knowing the technique, I overlooked the sharp teeth and open mouth

and reached behind and grabbed its tail. It was as good as in the bag. Truviño, running up with a sack, held it open and then Señor Iguana settled down for his trip to our little zoological park on Indefatigable.

Curiously enough we have never, and I am given to understand from inquiries, that others have never seen a young land iguana. Whatever iguana one sees is matured. The sea iguana, on the contrary, is conspicuous from the day it hatches, sitting on the rocks in true gregarious fashion. The land iguana lays four or five eggs, which are undoubtedly buried like all lizard and turtle eggs, and that is the end of the mother's care. But why, in our four months on the islands, did we never see baby land iguanas, and why have not others seen them? I do not know. I do not think it likely that the iguana places the eggs in the deep hole in which it lives, because of the possibility of crushing the eggs. Hawks are plentiful and the little fellows may be on guard against them and thus hide in such manner that they may not be detected.

Mating among the land iguanas differs not a whit from the same instinct as manifested by the sea iguanas. The great crested males put their heads together and push back and forth, snorting and scrapping. After the struggle between the two males is over the female is approached with definite humility. The male's head shakes violently. The female remains stationary. Led on by her docility, the male drapes his foreleg over the female's back, and then, as the female begins to open its mouth and move away, the male bites the skin, just above the neck. Locked thus there is a great tussle, the female frees herself and runs a short distance away, waiting with true feminine coquetry the continuance and repetition of this reptilian love-making.

On the continents of Central and South America this particular species of iguana is found neither fossil, nor living. It is not known where the land iguana came from or how it got to the Galápagos. Darwin visualized these islands as being ejected from the sea, the result of sub-

terranean volcanic action. More recent investigators have suggested a land connection between what is now Costa Rica and the Galápagos, a land bridge over which Mesozoic reptiles—iguanas, lizards, tortoises—crossed and remained isolated on this land arm. There has not been found, I believe, fossil remains of the land iguana on the South American continent. And it seems a little too naïve to say that all of the specimens of this species of iguana migrated to the long sea-arms that went out toward the land masses of the Galápagos. It may not be impossible that both sea and land iguana have had a common ancestry, yet no sound conclusion can be reached at present because these interesting reptiles have been little studied by herpetologists.

Four very pleasant days were spent on Barrington. There were no mosquitoes since there were neither stagnant water nor mangroves on the island, and it was very agreeable to be able to swim in the snug harbour, something we could not do on Indefatigable. In the afternoon the seals would take to the water after their midday siesta. The young ones would come near to us, as curious about us as we were about them; as they swam by I could give them playful spansks on their backs: they would submerge and come again to repeat the sport. All would go well until the great bull seal saw us, he would roar, charge into the water and we would scatter, the seals one way, and we another.

CHAPTER XVI

TORTUGA BAY—INDEFATIGABLE ISLAND

AGAIN out in the open sea we made our way back to Indefatigable ; but not yet to Academy Bay, for Estampa wanted some sea turtles, and these, he explained, were best found at Tortuga Bay, fifteen miles below the settlement at Indefatigable. After three hours' sailing we entered Tortuga Bay, a large circular, closed harbour, with a white sand bottom over which myriads of immense sea turtles moved in flashing grey-green shapes. The shallow bay is rock-bound or, better, lava-bound and with the typical cactus surrounding it.

Estampa and Truviño took to their small dory, first landing Christine and me on the arm of the bay nearest the sea. Since Estampa would be occupied in getting sea tortoises for some hours, we took to our collecting. We separated, she following the line of least resistance over the sharp-pronged lava crevices in a vain search for a tree that possessed leaves ; I, to wander along the shore looking for bits of drift wood which might contain insects that had been transported on the flotsam from the mainland.

I had wandered for an hour, passing along the beach and then into the thick-leafed succulents close to the shore. The great rib-bones of whales festooned the chalk-white beach. I had seen these so often they no longer excited my interest. To the left, on a small knoll fifty feet from the surf, there were other bones ; a seal, I thought, and looked no more closely. Then my attention was drawn to the skeleton. I picked up a femur : why, it was the skeleton of a man ! I searched the ground ; I could find no skull. I shouted to the

others, and, as they were only a few yards away, the three came as fast as they could scramble over the lava.

"Look!" I said excitedly, "the skeleton of a man."

"Where's the skull?" said Christine.

"I don't know, I was looking for it, when I thought I would call you."

It had been only seven months before that the press of the world was rocked by the romantic comico-tragedy of the Baroness *v.* Wagner and Dr. Ritter, of Charles Island. The finding of a new skeleton aroused great excitement in Estampa and Truviño. We searched the ground for some identification. The skeleton lay close to some bushes; Christine looked under them, and we were startled by her cry:

"Look, look, under the bushes!"

We ran forward and followed her pointing finger. There was the skull of our skeleton with the lower jaw lying close by, grinning with a full complement of teeth. I examined the skull: the teeth were intact, some of the molars had a few silver fillings, the cranium was large. The entire skeleton, indeed, seemed to be that of what had been a large man. We searched the ground anew and found nothing more, neither clothes nor shoes, not any means of identification.

"Who do you think it is, Estampa?" I asked.

"Could it have been one of your former companions?"

"No," he said, "I know everyone who has died here. I was thinking that it might be someone of the crew of the bark *Alexandra*. They were lost near here, in 1906. I think two men died. Finsen has the log-book of the captain of the bark that was published in Norway."

"But," I objected, "look, Estampa, the bones are well-preserved. The pelvis has cracked, of course, and all the bones are disjointed, but certainly a skeleton could not remain in such good condition for thirty years."

"Well," he answered, "look at the whale-bones on the islands; do you know how long ago it is since the whalers have hunted whales here? Fifty, sixty years.

Those bones are washed by the sea, and, look, most of them are in good condition. This is an arid climate and the body is on sand. The skeleton might be ten or fifty years old."

And so the mystery 'thickened.' We returned to Academy Bay and our discovery was soon reported over the whole settlement. Fortunately, Finsen was down from his ranch, and for once his interest was aroused so that he got out the captain's log at once. The log, printed in 1915, told the tale of the loss of the bark *Alexandra* in Galápagos waters. Finsen read the Norwegian text and translated it into English as he went along. It was a stirring story. We forgot about supper as Finsen read on and on by lantern light! '... The bark *Alexandra* was sailing from Newcastle to Panama. . . .'



THE DARWIN MONUMENT AT CHATHAM ISLAND
ERECTED BY THE EXPEDITION, WITH ONE OF THE
U.S. NAVY PLANES FLYING OVER IT

ISLANDS OF GALLAPAGOS



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THE PIRATES' MAP OF THE GALÁPAGOS ISLANDS

Drawn and embellished by Capt. William Hack and presented to Charles II along with a portfolio of other maps, on his ascent to the throne. Original on British Museum Sloan MSS.

CHAPTER XVII

THE TRAGEDY OF THE BARK *ALEXANDRA*

‘THE Norwegian bark, *Alexandra*, in November, 1906, was making for Panama carrying coal, not to, but from Newcastle. Commanded by Captain Emil Petersen, there was a motley crew of twenty aboard, including two American seamen.

‘They sighted Galera Point, near Guayaquil; two days later, although the sails were partly filled, Galera Point was not in sight. Then it grew calm, not a breath of air stirred the Pacific; the *Alexandra* had struck the equatorial doldrums. Caught in the strong Humboldt Current the vessel began to drift westward. Day after day it was calm. . . . With the equatorial sun glaring overhead, the men’s thirst became maddening; the ship was helplessly drifting and a new and greater peril faced them: the water was getting low. They began to use the condenser; after fourteen days it sprang a leak and a day later the bottom fell out. Now there was only the water remaining in the tanks. Lessening food, lessening water, drifting ever outward, the whole still Pacific before them.

‘The crew threatened mutiny; they wanted to take to the whale-boats; the captain insisted they could not and would not desert ship:

“Damn fools that you are, you couldn’t make five miles a day rowing in this current. Why, this current is moving thirty-five miles a day. This calm can’t keep on forever; it’s logical that this current will carry us over the Equator. There’s islands there called the Turtle or Galápagos Islands. We can stay there to wait for a change of weather.”

‘The crew listened in silence. One seaman, an American named Dick, asked: “Well, captain, how long do you want us to wait? Two weeks? Is that all right, boys?” he said, turning to the crew behind him. “All right, captain, we wait two weeks. If at that time the calm continues, we take to the boats.”

‘Every man on board began to count the days; leaving the helpless ship seemed to them to be their only hope of safety. Then, one day something wonderful happened: a weak breeze rippled the oily, flat sea; the ripple approached, wavered, and at last reached the ship. The crew hung over the gunnels drinking in the breeze and bathing their eyes in the spindrift thrown up by the wind. The ship manœuvred about to catch the full benefit of every puff and the bark *Alexandra* responded and sailed with the breeze, tacking to use the force to its full advantage. The bark sailed again like a living thing; the wind filled the sails, the sea was alive with leaping waves.

‘The water supply dwindled and the men were put on ration. If they didn’t reach the Galápagos soon and replenish their water their doom would be sealed.

‘Then land was sighted and the captain made out the broad length of Albemarle at 91 degrees west longitude. Succour was near! Land! And the hope of the crew thrilled to seeing land again. But the doldrums set in once more. The ship drifted helplessly as before with the current. In the morning Albemarle was out of sight.

‘The crew again mutinied and demanded the boats, the captain and his two mates held them off by the points of guns.

‘“We do not abandon ship until I say so.”

‘The eighth of May came. The captain stood on the half-deck. Not a breath of air stirred; not a cloud. The sea rolled in quiet billows and the ship rocked on the swells so that the sails slapped emptily. The heat began to melt the pitch in the caulking on deck. Again the crew came forward and demanded to take to the whale-boats. The captain asked: “Who will stay

aboard and take the chance with me?" No one answered.

"All right, I will not set myself against you. If you can hold out we might make the islands. We have little water, each man must do his utmost. You know what it is to drift in the open sea in a small boat. These islands are not well known; the map doesn't mention fresh water anywhere. I shall have to use hard discipline. I will shoot the first man that disobeys. Understand? All right. Get ready to abandon ship."

The captain went to the mast and put up a sign, stating that they had abandoned the ship and taken to the boats at the Galápagos; whosoever found the ship was to put into the Galápagos in search of the crew. Then they left the bark *Alexandra*.

The captain steered one of the boats, the first mate the other. In each there were ten men; each had a small iron tank containing about twenty gallons of water—all they had left; compass, sextant, clothes, and some food. The captain sat and looked back at his ship as the men rowed from it. There it glided over the sea with all sails hanging limply in the dead air, rocking like some gigantic toy boat which some little boy had set adrift. Some day a wind would spring up; helpless it would be cast on some island, torn to pieces—his beautiful ship—his life-work would be flotsam and jetsam on some coral island. He watched until the masts were mere pin-points on the horizon.

The current was strong, progress painfully slow. Two boats' lengths forward—one backward. The second day ended and land was nowhere. The men had lost all spirit. The captain kept them rowing without halting, shifting every hour. The captain knew how it would end; the water supply would give out; without new hope or spirit the men would take to drinking seawater, become crazed and plunge overboard, one after another.

The third day the top peak of Albemarle was sighted and that gave the men new life. It was about twenty-

five miles away. The other boat was signalled to come close and stay alongside. The men increased their stroke, but at ten in the morning, under the glare of the sun, they wilted and for them there came the miracle of an off-shore breeze. Sails were made fast and then the men, as one, sank to the bottom of the boat. When they entered into rough water the swells lashed into the boat, but the men bailed happily from them the water that they hated. They talked of wild life, sleep, food, and water. Soon all their sufferings would be over.

'The breakers were high, the rugged lava-bound cliffs buttressed the whole shore, they cautiously made for an entrance—a small beach; the men pulled the boat on shore and leaped out joyfully. Now for water.

'Then they looked about them. Not a leafed bush. Burnt rocks, clinkers, lava, burned-out craters, fumaroles, vents, extinct volcanoes, not a bit of soil. The men rushed up to the lava-beds, falling, tripping over the sharp lava. The tops of the hills were veiled in mist. Then the new horror came to them: they were on volcanic islands, there was no water at all. "And now, captain?" said one of the crew.

"We must rest and then sail to Charles Island, which should be, according to the map, about fifty miles south-west of here. I know that whalers in the old days went there for turtle and they said one could get some water there. Here, surrounded by volcanoes, there is not a drop. Better get some rest, men."

'Not a word was spoken. Darkness settled. The hulk of Albemarle sank into shadows of the night which blanked out the sea——'

Finsen stopped reading from the log-book. The mosquitoes were swarming about us. Night had blackened out Barrington Island which always caught the last rays of the sun.

"Perhaps," said Finsen, "we'd better put this thing off until to-morrow. It's a small book, only ninety pages, but I can't read by this light."

We were too interested to have him stop and so we

transferred ourselves to Mr. Rader's house. With him as added audience Finsen began reading the log-book again.

'Once more the whale-boats took to the high seas, fashioning their course west by south by west.'

"They must have been on the extreme tip of southern Albemarle," said Finsen, "judging from the captain's position."

It was then late May, when the islands are at their very worst. The heavy *garua* obscures the sun; no rain falls, only a light mist, not enough to collect in small canvases. The mist obscured their observations; they could not get a sight on Charles Island. Then the captain's boat lost sight of the first mate's. They wondered if their fellows had been lost and 'cracked up' on the rocky shore. It was hard to think that the other boat would purposely desert them, after all the trials that they had undergone together. But that was of little moment beside their next misfortune.

'It was in the grey of the dawn. The second mate came forward, shook the dozing pilot's shoulder: "Captain," he said in a frightened whisper. "What is it?" "My God! the cork was loosened, our fresh water has leaked out."

'The dozing men only half-heard; when that intelligence had seeped through their dulled wits there was pandemonium. Each accused the other: "Who kicked the water?" Now they had only ten litres left.

'Finally quieted, the men set to rowing again.

'Calm—strong current—glowing heat—unheeded thirst—such was that day. The mists cleared for a little while. Toward dusk they saw the great hulk of Albemarle and Indefatigable for an instant, then came the fog again and obscured everything.

'The 20th of May they had Indefatigable straight before them. They had done all that was in their power to do. The current was now too strong to row against. They had almost no water left; they were exhausted; they must land on Indefatigable. This would be their last struggle.'

Now came the most terrible six months any ten men ever spent. Without water, on volcanic islands, with only a pair of shoes to each man and the most difficult terrain in the world to walk on, sharp jagged basalt that cut through leather as if it were paper. They took to their boat again, hoping to find a more suitable spot to land. The men slowly began to drift into a lethargy. 'One of the seamen raised burning, insane eyes. He put his hand into the salt water to drink. "Stop it," shouted the captain, "the first one who drinks sea water will get a slug of lead in his head." The man gave him a hopeless look and sank back in the bottom of the boat in a stupor.

'Again they landed. The captain was for continuing by the sea, the men for travelling on the land. Then they were deprived of choice. A breaker caught the anchored boat, dashed it on the rocks, and made splintering-holes in its side. The die was cast. They would now be confined to land.

'Two giant seals were sleeping on the beach, utterly unafraid of the men. The men rushed up, clubbed them, cut into their throats and sank down drinking the warm blood as it gushed out. That relieved their thirst somewhat. They gathered a light load, made a cache of the rest of the supplies of the boat, and began the trek along the shore. Some of the men chewed on the cactus pads to quench their thirst; the human line began to lengthen out as the strong proceeded, the weak dropped behind. The men were cut and bleeding from walking on the lava; they had sea-legs, they were not used to crawling over the lava rocks, which require a sure footing. The flat lava rocks broke off easily, giving a metallic sound as they dropped down into the small abysses that break up the landscape. Some of the men ahead came to a little valley and sighted a tree bearing a yellow fruit, which looked like small apples. One tasted them, they were bitter, but they found them more nourishing than cactus leaves. Soon all were eating the fruit.'

Christine interrupted the narrative: "Goodness, they were eating the poisoned manzanillo!"

Finsen read on, translating from the text without hesitation.

'The captain came up and admonished them for eating a fruit they didn't know about, but as they showed no ill-effects he thought it all right. That night those who had eaten the fruit felt its effect. The men writhed with pain, rolling on the ground, broke out with a cold sweat, their throats and tongues swelled so that they could swallow nothing. But in the morning the pain lessened.

'A few days later they found brackish water, and for a while they stayed by that pool which rose and subsided with the tide of the sea. They tried to make things more pleasant. Dick, one of the Americans who had lived in the south-west, knew more about looking for water in dry country than the others, and he learned to mount the lava stones without falling. Then the shoes gave out. Seals were killed and their skins made into crude boots. They lived on seal meat, iguana, and pelican, until they found the sea turtles at Tortuga Bay, and with this food they became somewhat stronger. It kept them from scurvy. Two, three, four months passed; no vessel was seen. Some of the men adapted themselves to the new life, even finding some release from their sufferings by making hunting expeditions into the interior, outwitting the animals, who by now were becoming very timid and scarce from the constant depredations to their numbers. Some of the other men were in a perpetual stupor, occasioned by the lassitude. One in particular would not lend a hand to any endeavour. He grew weaker and paler and fought often with the other men.

'Then, one day, the first tragedy struck the camp. They lost a companion, Martin Schaeffer, the only German of the party. They were at the turtle lagoon, and Martin, who could not swim, disappeared during a tussle with the turtles. Silence reigned over the camp

that night. What could they say? A companion, a man, one of them was gone. Now, they were nine.

'The captain insisted, after five months had passed, that they must leave this lair of theirs and find a place, a harbour, a bay into which a boat could put. They must there keep a vigil for passing vessels, for certainly by now someone had found the drifting bark *Alexandra*. Accordingly they pulled themselves together and began another long trek. On the way, at a small cove, they found the evidence of recent occupation by human beings—a fire, a can, upturned rocks, footprints.'

"That, Finsen," I interrupted, "must have been the members of the California Academy of Science Expedition. They were on Indefatigable Island in October, 1906."

'Well, anyway,' Finsen read on, 'that sight cheered them on, they came up to Tortuga Bay and crossed around behind it. On the shore they found poor Martin Schaeffer, or what the sharks had left of him. They stopped to give him a burial in the sand and then continued.'

'A few days later, Charles, the man so long in a stupor, would not go on. "Are you mad?" shouted the captain. "If you stay behind you'll starve!" "Go, and be damned." Charles said, and laid himself down.'

'The others stood about the fire and stared at one another. They could not purposely leave a man behind to starve. Throughout the night they stayed on and urged him to try to go on. Charles was adamant. In the morning they began to get ready to go.'

"Will anyone," asked the captain, "remain behind with me and take care of him?" The men just shrugged their shoulders and answered, "No!"

'They remained another day while each in turn tried to coax, cajole, bully Charles into going. Then they all left. After they had been gone about an hour, the captain went back to make another attempt to get him to join them. It was hopeless. Charles said:

"Rescue will come here just as soon as any other place and I will make my way."

'Then the captain had to go. From the top of the first hill he looked back. Charles had thrown himself down in the sand outside the brush. A weak smoke arose from the fire. Charles lay with his bushy hair and whiskers and ragged clothes, staring into the air. "The poor lost man." The golden beach, stretched out in a great half circle. The utter loneliness of the place—one so young—it was a picture that made one sick at heart.

'The captain waved and shouted, but Charles did not look at him. So he turned and went on to join the rest. Charles was left with loneliness and death before him.

'Now they were eight.

'Eventually they came to the place which we now call Academy Bay. There they found the brackish water wells (which we used now), green grass, trees—it seemed a paradise alongside of the place they had quitted. Fresh hopes rose in the men. A flag was set up to warn any passing ships. They busied themselves to help the passage of time, then one day——

'A ship! a ship! a schooner! a schooner!

'Men rushed down to the beach and then up the cliff to set on fire a great pile of brush. The smoke went up, the flames roared and the men frantically waved their ragged clothes at the ship. It was quite far out, but the whole of it could be seen. The ship circled the small island in front of Academy Bay and looked as if it was going by. Their hearts sank. Some still swung their rags into the air, then they slumped to the ground.

'But the boat had seen them, it was turning to avoid a small reef and made for the bay. It was the sloop *Isadora Jacinta*, from Guayaquil, with a German captain. It had been sent from Guayaquil by Norwegians to search for the men. The bark *Alexandra* had been found; the other whale-boat had got to Chatham and they knew that on one of the islands, alive or dead, were the captain and his crew. At first the captain of

the sloop had tried all the other islands, and it was only by the caprice of the current that he had tacked by the weather-side of the Indefatigable. The currents that had almost destroyed the crew of the bark *Alexandra* had saved them.'

An expedition was to have been organized in Guayaquil to return to hunt for Charles, who was left, or decided to be left, alone. The boat never sailed, and Charles was never seen again until I found him, bleached and parched on the sands at Indefatigable.

'Oh, Brother Jack, as you pass by,
As you are now, so once was I,
Just so game and just so gay,
But now, alack, they've stopped my pay.
No more I peep out of my blinkers,
Here I be—tucked in with clinkers.'

CHAPTER XVIII

MAN COMES TO THE GALÁPAGOS

THE episode of the bark *Alexandra* points out very well how man first came to these enchanted islands. In February, 1535, the Bishop of Panama, Tomás de Berlanga, left the Isthmus for Peru, there to place limitations, by Royal Decree, on the power of Francisco Pizarro. He proceeded down the coast. Since his letter, describing in detail the discovery, exists, let us allow the good Bishop to tell it in his own manner :

‘ PUERTO VIEJO,
‘ April 26, 1535.

‘ SACRED IMPERIAL CATHOLIC MAJESTY :

‘ It seemed right to me to let Your Majesty know the progress of my trip from the time when I left Panama, which was on the twenty-third of February of the current year, until I arrived in this new town of Puerto Viejo.

‘ The ship sailed with very good breezes for seven days, and the pilot kept near land and we had a six-day calm ; the currents were so strong and engulfed us in such a way that on Wednesday, the tenth of March, we sighted an island ; and, as on board there was enough water for only two more days, they agreed to lower the life-boat and go on land for water and grass for the horses, and once out, they found nothing but seals, and turtles, and such big tortoises that each could carry a man on top of itself, and many iguanas that are like serpents. On another day, we saw another island, larger than the

first, and with great sierras; and thinking that, on account of its size and monstrous shape, there could not fail to be rivers and fruits, we went to it, because the distance around the first one was about four or five leagues, and around the other ten or twelve leagues, and at this juncture the water on the ship gave out and we were three days in reaching the island on account of the calms, during which all of us, as well as the horses, suffered great hardship.

'The boat once anchored, we all went on land, and some were given charge of making a well, and others of looking over the island; from the well there came out water salter than that of the sea; on land they were not able to find even a drop of water for two days, and with the thirst the people felt they resorted to a leaf of some thistles like prickly pears, and because they were somewhat juicy, although not very tasty, we began to eat of them and squeeze them to draw all the water from them, and drawn, it looked like slops, of lye, and they drank it as if it were rose water.

'On Passion Sunday, I had them bring on land the things necessary for saying Mass, and after it was said, I again sent the people in twos and threes, over different parts. The Lord deigned that they should find a ravine among the rocks as much as a hogshead of water, and after they had drawn that, they found more and more. In fine, eight hogsheads were filled and the barrels and the jugs that there were on the boat, but through the lack of water we lost one man, and two days after we had left that island we lost another; and ten horses died.

'From this island, we saw two others, one much larger than all, which was easily fifteen or twenty leagues around; the other was medium; I took the latitude to know where the islands were, and they are between a half-degree and a degree and a half south latitude. On this second one, the same conditions prevailed as on the first; many seals, turtles,

iguanas, tortoises, many birds like those of Spain, but so silly that they do not know how to flee, and many were caught in the hand. The other two islands we did not touch; I do not know their character. On this one, on the sands of the shore, there were some small stones, that we stepped on as we landed, and they were diamond-like stones and others amber coloured; but on the whole island, I do not think that there is a place where one might sow a bushel of corn, because most of it is full of very big stones, so much so, that it seems as though some time God had showered stones; and the earth there is, is like dross, worthless, because it has not the power of raising a little grass, but only some thistles, the leaf of which I said we picked. Thinking that we were not more than twenty or thirty leagues from this soil of Peru, we were satisfied with the water already mentioned, although we might have filled more of our casks; but we set sail, and with medium weather we sailed eleven days without sighting land, and the pilot and the master of the ship came to me to ask where we were and to tell me there was only one hogshead of water on the ship. I tried to take the altitude of the sun that day and found that we were three degrees south latitude, and I realized that with the direction we were taking, we were becoming more and more engulfed, that we were not even heading for land, because we were sailing south; I had them tack on the other side, and the hogshead of water I had divided as follows: half was given for the animals and with the other half a beverage was made which was put into the wine cask, for I held it as certain that we could not be far from land, and we sailed for eight days, all of which the hogshead of the beverage lasted, by giving a ration to each one with which he was satisfied. And when that hogshead gave out and there was no relief for us, we sighted land and we had calm for two days, during which we drank only wine, but

we took heart on sighting land. We entered the bay and river of the Caragues on Friday, the ninth of April, and we met there the people of a galleon from Nicaragua who had left eight months before, so we considered our trip good in comparison with theirs. . . .

'The Lord fill Your Sacred Majesty with holy love and grace for many years, and with the conservation of your realms and an increase of other new ones as I hope. From this new town of Puerto Viejo, the twenty-sixth of April, in the year fifteen hundred and thirty-five. I am Your Sacred Imperial Catholic Majesty's most true servant and subject and perpetual Chaplain who kisses Your Royal feet and hands. Fray Tomás eps. Locastelli Auril.'

The official report of the Bishop with the pilot's map was forwarded to the archives in Seville. In 1574 the Galápagos Islands appeared on the map in their true and relative position in the Pacific, engraved by Ortelius, who included the islands in his map of Peru—*Peruvia Auriferæ Regionis Typus*. As I have said earlier, Ortelius named the group 'Los Galápagos' because of Berlanga's mention of the tortoises. Fifteen years later the name was changed to 'Las Encantadas,' because of the currents which seemed to be bewitched.

The legend of the Galápagos took greater and more solid form when Pedro Sarmiento de Gamboa fastened on the facts of the voyage of Fray Tomás de Berlanga to link it with tales of Inca gold. He learned that the great Inca, Tupac Yupanqui, while carrying on a war of conquest with the kingdom of the Quitus to the north, came with his hosts to the port of Tumbez, where he encountered several large balsa rafts returning from a sea voyage. Inquiry informed him that they had come from the islands Avachumpi and Ninachumpi, which, according to these Indian merchants, were rich with gold. The redoubtable Inca, so the legend continues, gathered twenty thousand soldiers and building a fleet of immense balsa rafts with single sails and great rudders set off on a voyage of discovery. He remained

away a year. When he returned the Inca had with him 'Indian prisoners, black in colour, much gold and silver, and the hides of animals like horses.' Pedro Sarmiento de Gamboa identified the discovery of Fray Tomás de Berlanga with these islands; he did not stop to consider that as the islands were volcanic there could be no gold, or that the Bishop reported the islands uninhabited and unable to support habitation.

The total inaccuracy of the legend of the voyage of Tupac Yupanqui, the eleventh Inca, to the Galápagos, as set down by Padre Bernabé Cobos, must lead us to deduce that either the legend was made up to whet the appetites of the *conquistadores* by some astute Inca who hoped thus to get rid of a few of them, or that the legend pertains to some other islands. The only type of craft known to the ancient Peruvians was the crude balsa raft with primitive sail. It does not seem possible that such rafts could have made their way to the Galápagos and return with naught but the stars and pure instinct for guidance. We know that the seaman-ship of the ancient Peruvians was rudimentary, and such marine traffic as there was, was purely coastal. The doldrums and the currents that even to-day with all our modern scientific instruments make a voyage there difficult, make the voyage of Tupac Yupanqui seem highly improbable. Moreover, the purported finding of gold, silver, and copper there, places the legend in the category of the wholly fabulous. For in this volcanic archipelago no minerals are to be found.

We are definitely certain, too, that the archipelago supported no autochthonous inhabitants. Sarmiento de Gamboa accepted, apparently without reserve, the legend of the Inca's voyage, for he vowed that the booty brought back by Tupac Yupanqui was preserved for a long time in the fortress of Sacsahuman in Peru, and he specifically identifies the islands of Avachumpi (the fire island) and Ninachumpi (outer island) with the Galápagos Islands of the Bishop's discovery. Persuading the Viceroy that these islands were the outposts of a great

continent in the austral ocean, Gamboa asked for two ships and funds sufficient to maintain one hundred and fifty men, that he might take the islands for the glory of Spain (and, too, of Sarmiento de Gamboa). In 1567 the ships set sail for the Galápagos or, at least, where the pilots thought they were. The expedition ended up at the Solomon Islands.

For the next three decades, however, the islands were unvisited. Then came the English pirates to Pacific waters. To the dismay of the Spanish colonists, on the night of 13 February 1597, Sir Francis Drake in the *Golden Hind* swooped into Callao Bay from the south. The corsairs were in quest of the ship *Miguel Angel*, which, so they had heard, was laden with silver bars. Missing this ship, they captured a merchant ship, cut the cables of nine others within the harbour, and took a hasty northerly course. About the same latitude as Guayaquil, they captured the Spanish treasure vessel, *Nuestro Señor de Concepcion*, called Cacafuego by Spanish sailors. The treasure was divided on the famous Isla de la Plata, a few miles off the coast of Ecuador. This great silver horde of Peruvian pesos started the 'pieces of eight' legend that spread like wild-fire.

At the beginning of the seventeenth century, the islands became an almost exclusive rendezvous of the English buccaneers. It was not altogether jealousy of Spain's New World possession and her refusal to trade with foreigners that brought pirates streaming into the Pacific. There were the regular shipments of gold from Callao and Guayaquil, and from Acapulco and Amapalla to Panama City; these whetted the gold-thirst of the buccaneers. In 1593 the corsair Sir Richard Hawkins was in the Pacific; he devotes but one line to the Galápagos Islands in his Memoirs, but, since he was the first Englishman to visit them, he suggested their possibilities as a refuge for the raiders of Spanish gold. After a raid on the Spanish ships of commerce, the Galápagos was a safe place to put in while the Armada was in pursuit.

The Spaniards about the Isthmus of Panama and Darien were up in arms at the repeated raids of the English pirates, and their attempt to cross the Isthmus into the Pacific was thwarted so often that the buccaneers decided to make a bold bid for the gold that came from Peru to Panama by way of the Pacific coast. Dampier, Cook, with Lionel Wafer as 'Chyrgeon,' and William Ambrosia Cowley as pilot, sailed for North America on the frigate *Revenge*. On the voyage they met with a ship from Denmark carrying thirty-seven large guns and seventy men. A ruse, of which Cowley was the author, deprived the Danes of their ship, which was boarded, taken, and re-baptized the *Bachelor's Delight*.

This frigate was to play, in the next five years, a notable part in the history of the English buccaneers, and also in the history of the Galápagos Islands.

After missing the entrance to the Magellan Strait, the *Bachelor's Delight* entered the Strait of Le Marire in February 1684 in the teeth of ferocious gales. Meeting Captain Eaton aboard the frigate *Nicolas* they sailed in company to the islands of Juan Fernández. Moving cautiously along the South American coast northward, remembering to stay out at sea as much as twelve to fourteen leagues, so as not to arouse suspicion on the shore, they moved toward the Equator. In May they captured a vessel coming from Guayaquil and bound for Lima loaded with timber. Questioning the captured Spanish officers and learning that the Spanish authorities knew of their presence within the South Pacific, they moved their prize to the Lobos Islands, where they cleaned their fouled vessels. While there they spied three other Spanish merchant vessels, and after a chase, and a short fight, captured them. Fearful lest the noise of the cannonade had aroused the Spaniards about Callao, the buccaneers withdrew to the Galápagos Islands with the three prizes in tow.

There the treasure was divided among them. Captain Cook, who was ill, was put ashore. Presumably Conway Bay on the east side of Indefatigable was their head-

quarters, for on the chart of Cowley this part is marked with an anchor. Here, too, certain supplies were cached for future use. In connection with Conway Bay, there is an interesting point. It will be remembered that this is the site of the plantation from which the Norwegians to-day get bananas, yuca, sugar-cane and corn. Though the plantation is now quite wild, it still produces crops. There is no evidence of human habitation. From certain conditions of the crops, I estimated that these fields must have been seventy-five to one hundred years old. I then discovered a road that headed down to Conway Bay. This road was unknown until recent times, and none of the natives who have lived on the Galápagos Islands since their birth knew of anyone who had ever cultivated the western side of Indefatigable. It is possible that the English buccaneers, who made the islands their headquarters for fifty years, might have tried to establish a means of food supply, with the help of their Spanish prisoners who were familiar with yuca and sugar-cane.

While the *Bachelor's Delight* was within the Galápagos, and while Captain Cook was recovering, Ambrosia Cowley took time to chart and name the Galápagos Islands. The naming was a singular procedure, for they were named after the nominal enemies of the English buccaneers. I say 'nominal enemies,' for it was supposedly English policy to co-operate with Spain in the punishment of the buccaneers. Some of the islands were named in honour of the English officials at Nassau and Bermuda, who had instructions from Charles II of England that piracy was to be rigorously suppressed. Spain had complained vigorously to the English that the depredations of English privateers were countenanced by the English crown, and while thus officially England was not at war with Spain, its decrees against piracy were only half-heartedly carried out by the British officials at Jamaica. They constantly closed one eye to the piratical action of their countrymen, and at times both eyes.

For the lax enforcement of law by this group of men Cowley showed his gratitude by honouring them with islands in the Galápagos bearing their names. Wainman (called Wenman) and Brattle were named after Lords Wainman and Nicolas Brattle, and Bindloe after Colonel Robert Bindloss, who was a member of the Council of Jamaica and the brother-in-law of Henry Morgan; perhaps the buccaneers had reason to remember him kindly. The island which is now Chatham was called Dassigney's Island, after Sir Philip Dassigney. In the Sloane MS. in the British Museum there is a supplement map of the Galápagos in which Dassigney's Island is shown with the following sub-title: 'a very green island plentifully stored with Timber.' It shows also Mt. Morgan, named after the famous buccaneer, and Privateers' Rock, now called Dalrymple Rock, alongside. James Island had been called at first the Duke of York's Isle, but in May 1685, while at Chipillo Island, Dampier learned from Spanish prisoners of King Charles' death, and that James II, then Duke of York, had ascended the throne. The chart was then changed to read King James Island. When Cowley returned to England with his maps, a versatile artist and cartographer, Captain William Hack, copied them, making for the entire Galápagos Archipelago, a general map, as well as individual maps of each of the islands. The whole collection of fifteen folio maps is done in naïve perspective, with compass points and cartouches in gold leaf. I find that from them I can identify every island as we know them to-day. The buccaneers, despite their poor draftsmanship, always managed to include some prominent landmark to distinguish them.

The largest island of the archipelago was named, curiously enough, not for the reigning monarch, but for the 'King Maker,' George Monk, First Duke of Albemarle, the general who had restored Charles II to the throne. He was thus honoured because of his policy toward the buccaneers. The Duke had arrived in Jamaica in 1687 and at once allied himself with the sea-

rovers, even reappointing Sir Henry Morgan and Colonel Bindloss to the Council from which office they had both been suspended. The large island west of Albemarle was called after Sir John Narborough, Samuel Pepys' own protégé, the celebrated navigator who, in the year 1669, was dispatched by the Admiralty in His Majesty's ship *Sweepstakes*, on a voyage to the South Seas, partly commercial and partly exploratory.

The small island between James and Indefatigable, Cowley named Sir Anthony Dean's Island, after the ship-builder to Charles II. This gentleman, it will be remembered, was incarcerated in London Tower with Samuel Pepys for certain practices with regard to booty taken during battle.

Tower Island was named Mr. William Ewres' Island. Whether he was privateer or gentleman, and why the pirates honoured him, I have not been able to ascertain. To the north, adjacent to Bindloe's Island, was another large island, which Cowley named the Earl of Abingdon's Island, a name it still bears. The island named the Duke of Norfolk is now Indefatigable. Here, it is obvious, much time was spent, for all the points are named. Conway Bay has a large anchor and the mountains are well delineated. Off the western coast of Indefatigable are three small islets that Cowley called Guy Fawkes, after the man who tried to blow up Parliament. I know not what inspired this appellation, unless the islands were in eruption at the time, and suggested the completion of an act Fawkes attempted.

During the next months of 1684-5 the *Bachelor's Delight* played havoc with Spanish shipping from Paita to Amapala. Arriving near Santa Helena, the *Bachelor's Delight* anchored there while the corsairs gathered pitch and petroleum to caulk their boat. By this time the Viceroy of Peru had sent word up and down the coast that if the English should be sighted near any port, all Spanish vessels in the harbour were to be burnt, 'so as not to lend wings to the enemy.' In addition, men were sent to several islands to destroy goats and any

food that the pirates might have cached there, so that the buccaneers could not victual ship. Under these provisions dogs were landed on several islands of the Galápagos with the hope they would kill off the goats that had been put there years previously by the English for a reserve food supply.

In June 1685 the *Bachelor's Delight* moved again into the Galápagos Islands searching for provisions. There they made their way hoping to recover the flour that they had cached the year previously. This return voyage has been recorded by Lionel Wafer, 'chyrgeon,' who in writing perhaps refers to James Island; he says in part:

'From hence we stood on still to the south and came to one of the Gallapago Islands lying under the line. Upon one of these Islands we found a great many very large land tortoise of that sort which we used to call *Hecattee*. Upon this Island no water is to be found but in one place whither I observ'd these Animals frequently go to drink but they go not into the water.

'At this Island [James] there is but one watering place [Albany Island], and there we Careen'd our ship. Hither Turtle-doves and other Birds resorted for water; which were at first so familiar with us, that they would light upon our Heads and Arms; insomuch that for several Days we maintained the Ships Company with them. But in a little while they began to be so shy, that we could kill none, but what we shot. Here are some Guano [sea iguana] very plentiful, which are very good food. There grows a sort of wood [*palo santo*] in this isle very sweet to smell. 'Tis but a low tree, not shrubby, but like the pear-tree, tho' thicker; and full of sweet gum. While we lay there at the Gallapagos we took in at one of the islands [Indefatigable] there five hundred packs of flour, which we had formerly left there upon the rocks; but the Turtle-doves had devoured a great deal of the Flour, for the bags lay exposed to the Air.'

In the autumn of 1687 the *Bachelor's Delight*, with Davis and Lionel Wafer aboard, put in once more at the Galápagos Islands for turtle meat, and from these islands they passed around the Horn. After months of frightful weather they put into the port of Montevideo. Thereafter the fate of the *Bachelor's Delight* is lost in obscurity.

While it is true that the Galápagos Islands were known and occasionally visited by the Spaniards, they did not leave their impress upon them as did the English. Names that were given the islands by the Spanish navigators were either never recorded on important maps, or were not sufficiently descriptive, for none remain, save one, and that is Santa María del Aquador, to-day known as Charles in English, Floreana in Spanish.

Antonio de Herrera, in his most noteworthy *Historia General de los Hechos de los Castellanos*, in 1607, depicts the Galápagos Islands in the general map of South America. The islands were known then as Islas Galapagos (and the Galápagos is one of the few important groups of islands in that map) yet throughout the whole of the text of the *Historia* there is no mention of the Galápagos Islands, not even of their discovery by Tomás de Berlanga, although the voyage of the Bishop during the time they were discovered is discussed at some length.

One of the first maps to show the Galápagos in relatively correct position and with names, as they were known to the Spaniards at that time, is the work of Don Jorge Juan and Antonio de Ulloa, in their well-known *Relacion Historia del Viage a la America Meridional* (1747). On their map of the coast of South America and the approximate islands we are given the curious names by which the Galápagos Islands were known. Albemarle is easy to discern, as it is shown quite large, and lies partly across the Equator (as is quite true, geographically) and is called 'Ysabel'; Chatham (San Cristóbal) is known as San Clemente; Abingdon (Pinta) as Quita Sueño (Nightmare); James (Santiago) as Carenero; Culpepper and Wenman Islands as Los dos Hermanos. Hood is here obviously called Santa María

de la Aqueda, either in an error of naming or position, as this name was traditionally applied to what we now know as Charles (Floreana) and N. S. de la Esperanza, which represents those two islands known as Crossman and Brattle.

The close of the eighteenth century saw the end of privateering and ushered in the rapid growth of commerce and political expansion, movements in which the Galápagos Islands were again to figure. Whales were known to frequent the Galápagos Archipelago for the waters were cool and calm, and there were many excellent places where the whales could reproduce. As early as 1780 the young United States of America and her erstwhile mother country, England, were having disputes over whaling grounds. England, with her greater naval tradition, was able and ready to explore new whaling areas.

In consequence of a Memorial, planned in conference by the merchants of the City of London who were concerned in the South Whale Fisheries, Captain James Colnett, of the English Navy, was placed in command of H.M.S. *Rattler*, and charged with the commission of finding ports in the Pacific where whalers might refit and victual ship. South America was still controlled by the Spaniards who allowed few ships to come into their harbours and who, at the time of Colnett's voyage, were ready to abrogate even the small courtesies they had given to foreign vessels. Colnett sailed from England in January 1793 and took the general route around the Horn; after touching at Peru he made for the Enchanted Islands, 'knowing it to be an object of the Board of Admiralty that I should visit the Gallapagos Isles.'

Captain Colnett found the tortoises plentiful, and the islands a fitting place to beach the whaling-boats while the men fed on the tortoise and cactus, thus relieving themselves of scurvy. Whales seemed to be plentiful. Four years after the voyage Colnett published a large folio volume called: *A Voyage to the South Atlantic, etc.,*

and with that book the modern age of Pacific whaling had its genesis and the second phase of the Galápagos Islands began. Colnett also supplied the first modern map of the Galápagos. Some islands already charted by the buccaneer, Cowley, he could not locate and so they were renamed. Sir Philip Dassigney's Isle was named Chatham, after William Pitt, First Earl of Chatham; Barrington, which was not on the map at all, he named after Sir Samuel Barrington, Admiral of the Blue; Charles Island, he found, and its name remained; a small island to the east of it was christened after Lord Gardner; the small island of Jervis, near James, was called after an admiral, and finally, Sir Anthony Dean's Island was changed to honour Viscount Duncan, the famous English admiral, who won the victory against the Dutch off Camperdon, for which he was created Viscount of Camperdon.

So men continued to come to the Galápagos, mostly for the sake of the tortoises and also for the whales that 'calved' in the cool waters of the Humboldt stream, on the western side of Albemarle. Visitors included: New English whalers, among them Amasa Delano, maternal ancestor of Franklin Roosevelt; Captain Porter, father of the Civil War admiral, came in 1812 in the U.S. *Essex*, to harass English shipping in the Pacific; Midshipman Farragut, also of Civil War fame; the seventh Lord Byron, returning with the bodies of the King and Queen of the Sandwich Isles; whalers, privateers, smugglers into South America. There, too, came Herman Melville, as common seaman on the whaler *Acushnet*, to receive some scattered impressions which he later wrote into one of his finest writings. After the whalers came the scientists, drawn by Charles Darwin's highly suggestive writings on the Enchanted Islands. The tortoises began to disappear, and some of the common birds became scarce, for the collectors were as rapacious as the whalers.

The Republic of Ecuador took formal possession of the islands in February 1832, under the command of one Colonel Hernandez. The plan of annexation was conceived by General Villamil, who left his birthplace,

New Orleans, Louisiana, when it came under jurisdiction of the United States, and who gained, during the Ecuadorian wars of independence, certain distinction as a general. The individual islands were then rechristened; this time they were called after the discoverer of America, the 'Archipiélago de Colón.' The islands were renamed, mostly after the ships of Columbus, and those who helped finance his adventures. The first settlement was on Charles Island, which was promptly rechristened Floreana, after the first president of Ecuador, General José Flores. It is General Villamil whom we may thank (or curse) for the placing of pigs, burros, horses, and cows, not to mention dogs, rats, cats, on the Galápagos Islands.

He entered into a plan for colonization with a great deal of enthusiasm. He obtained a concession from the Ecuadorian Government in recognition for his services during the War of Independence. A colony was established on Charles, which in 1835, during Darwin's visit, had already descended to a very low and miserable state. Unfortunately, Villamil lost interest when the Government found the islands a suitable place to dump some of its political miscreants. Finally, the colony dwindled from two hundred and fifty to a mere handful of desperate folk who, in 1851, seized an American whaler, followed the Governor of the islands to Albemarle, murdered him, and then, having become thoroughly aroused, ran amok, captured another ship and killed the whole crew of twenty-nine. This led to serious difficulties with the United States, which ended the diplomatic impasse for settlement of the loss of the American whaler, by the United States offering Ecuador \$3,000,000 for the rights of collecting guano that might be found on the islands. This offer was refused.

The whole history of the islands, from their discovery until the present time, has been one of disaster for those who sought wealth and profit for themselves. No enterprise has ever been successful that attempted exploitation of the islands. Death, revolt, tragedy have been the end of every commercial scheme.

CHAPTER XIX

M.S. STRANGER

DECEMBER marked our fourth month on the Galápagos ; time had passed quickly with each day divided into a series of tasks, and we fell easily into a routine. In November the schooner *San Cristóbal* had brought us some mail—the first in three months—and we had made arrangements to be taken off the islands in February.

Far from being monotonous, our routine of collecting, observing, and tending to our meteorological instruments was pleasant and interesting. Spring was coming to the Galápagos. The temperature and sky revealed it. Consistently through the other months the temperature was very regular. At 6 a.m. the thermometer always hovered between 68–72 degrees ; it rose slightly during the day and retreated at six in the evening to the same reading that it had every morning. *Garua* and cloudy days characterized the first four months, then toward the end of November the temperature began to rise slightly, and the clear days, instead of being the exception, were becoming the rule. The Galápagos was transforming itself.

It was on one of these mornings that a ship appeared on the horizon moving up to Academy Bay. Excitement was general ; it was the first ship (one cannot count the *San Cristóbal* as a ship) that had been to the islands in a year. The colony at the beach was as excited as we were ourselves. It was a large ship, standing high above the water. I read the name *M.S. Stranger*.

Captain Fred Lewis, owner of the boat, was making his yearly visit to the Galápagos. Besides his very charm-

ing young wife, one guest, and a professional crew, he had along with him about thirty sea-scouts, to whom he had extended an invitation to gain practical experience aboard a large ship. Captain Lewis graciously asked if we would like to go for a few days' cruise about the islands and to this proposal we quickly assented. We could thus add to the intimate knowledge we had of a few of the islands, by obtaining a general view of the archipelago such as we could not otherwise have had. I took Estampa, the Norwegian, as pilot, and our faithful servant, Truviño, who knew the interiors of many of the islands.

From a very Spartan existence on the Galápagos we were plunged into relative luxury : here was food which we did not have to prepare and quite luxurious quarters. Captain Lewis was interested in wild life, and had purchased their two hundred and twenty foot boat from Mr. Armour, who once used it for collecting plants around the world. It was just the ship for the Galápagos, as it was not a yacht, although the appointments for guests were splendid. It was constructed more like a small freighter with a great hold, and in the rear of the ship there was a floating zoological garden where the captain kept the various animals he had picked up in Panama and on the coast of Ecuador.

We made first for Chatham to inaugurate the Darwin monument. Even from a distance one could see the bust on top of the lava pedestal, and I thought my masons had done quite well. With scant ceremony, the bust was unveiled and accepted by the Commander of the port in the name of science and the Republic of Ecuador. The masons had done a good job, but, as they had not been working under supervision, they had found a heart-shaped stone which they put into the centre of the monument and wrote thereon, in large conspicuous letters :

AURELIO BORRERO

—MASON—

This legend completely dwarfed the name of Charles Darwin. The work had taken a long time, because the masons could not chip the basalt with their chisels, and had broken most of them before they decided that they could not cut the lava rock. Thereafter they searched out each stone they needed, stones of the right size to build the fifteen foot pedestal.

HOOD ISLAND

We called at Hood Island, thirty miles south of Wreck Bay, where Captain Lewis wished to photograph the albatross colony. Hood is a truly desert island, elliptical in form, lying to the south-east of Chatham. Its highest altitude is 600 feet, but the general elevation is not over 200 feet. There are no trees on Hood; cactus and desert plants, fifty species, more or less, are the sum total of its flora. Yet Hood has certain unique features as has each island on the archipelago. It is the nesting place for the albatross, the beautiful sea birds usually associated with the colder regions of Patagonia. Quite unafraid, they will allow one to come right up to them. The Man-o'-war bird also nests in the south-east extremity of Hood. This small squat island has a most distinctive tortoise, and I was anxious to see if it was extinct as reported. Accordingly, Captain Lewis loaned me twenty sea-scouts whom I spaced out many yards apart and we searched the whole island for a day. It is with regret that I confirm the extinction of the land tortoise of Hood.

From there the *Stranger* shaped its course first to Barrington, then along the shore of Indefatigable to Gordon Rocks on the east side of Indefatigable. There on some coloured rocks, called Cerro Colorado, we found a new unrecorded colony of iguanas. These differed from those on the other iguana islands. They were a brick red, the result of their environment.

SEYMOUR ISLAND

Seymour was the next stop. It consists of two islands, North and South Seymour. South Seymour is

larger and is separated from Indefatigable by half a mile of water only three fathoms deep. Seymour undoubtedly was once a part of Indefatigable and has become separated by recent faulting. I used the word 'recent' advisedly. Seymour has two interests: land iguanas and a large colony of goats. The iguanas form a distinct species from those of Barrington. They are present on Seymour, Indefatigable, James, Albemarle, and Narborough. Their habits, in all respects, are similar to those of the land iguanas that I described on Barrington. Recently they were distributed to North Seymour, where the iguana had never lived, at least to our knowledge. The philanthropic Captain Hancock, of Los Angeles, who makes the Galápagos his exclusive domain, decided that the iguanas on South Seymour were starving (they have been there only some ten million years), and moved them to North Seymour. Now there is a reason why certain species occur on certain islands of the Galápagos, and until we can find out the distributional pattern for the fauna we shall not be aided by kindly gentlemen who redistribute the animals on the Galápagos. They make the puzzle more puzzling.

DUNCAN ISLAND

I persuaded Captain Lewis to move next to Duncan Island for it has a most remarkable tortoise. We knew the island well, but with twenty additional pairs of eyes, I might make the statistics on the fauna of the Galápagos far more exact. Accordingly we sailed for Duncan Island, which is separated from Indefatigable by only eight miles. It is small and circular, with the highest peak just under 1300 feet in altitude. But it provided no anchorage for large boats, and so the *Stranger*, standing out to sea, sent in three boat loads of sea-scouts. As we entered the small harbour a colourful scene met our eyes. Small penguins, like miniature caryatides, inhabited a range of rocky caves close to the mouth of the water. Dull-faced, red and blue-footed boobies gazed at us in amazement, and from the water

rose a half-score of pelicans. Pandemonium broke loose when we came in. The seals were taking their siesta in the full glare of the morning sun; the huge bulls let out barking, warning cries, and swam out to the craft in idle curiosity. Here, too, was the refuge of the sea turtles. We found them sunning themselves on the beach while larger ones in grotesque silhouette skimmed along the harbour bottom. Numbers of hawks came down as curious about us as we were about them. Striking a pose on a small post a hawk was an excellent camera study. I went as close as I believed he would permit and snapped his picture. Later I found that I could have put my camera up to his beak without his moving, in point of fact, I could not move him from his perch without first roughly pushing him with a stick. So little do these wild creatures know and fear man.

We then visited the small island that forms the break-water for the harbour. Here was the seals' sanctuary and we were not welcome, to judge from the protests lodged against us by the bull seals. We had heard so much of the tameness of the little seals that we approached them unhesitatingly. I handled them, much to the consternation of the little fellows and the suspicion of the mothers, who eyed me from two metres' distance. But the bull seal would not allow matters to stop there. Coming out of the water, he covered the short distance between us in three or four seal jumps. That he would not have attacked, had we remained, I now do not doubt. But at the time I allowed discretion, as the better part of valour, to dictate my movements. Thus I am able to say that I was not attacked. Had I remained I might not have been able to refute or substantiate the matter for the fellow weighed a good thousand pounds.

Duncan was first known as Sir Anthony Dean's Island, having been so named by Ambrose Cowley in 1684, when he christened most of the other islands. Then it was changed to Duncan by Captain Colnett. It has still another name, Pinzón, its official designation by the Ecuadorian Government after one of the Spanish

brothers who victualled Columbus on his first and second voyages to the New World. But no one, not even the Spanish natives of the islands, call it 'Pinzón.' It is Duncan to all intent and purpose.

Whoever has climbed it, felt the prick of the mesquite thorns, the spiny acacia, and stumbled over the sharp, hot lava stones, will remember this isle above all others. None compresses in four miles (which is Duncan's diameter) so much Dantesque horror. From the distance its central cone seems to be covered with a tall dry grass. On approaching nearer, this 'tall grass' is found to be the thorned acacia. There is little sub-soil and the climb is over a pathway of huge, sharp-edged volcanic stones, at an angle of forty-five degrees.

One does not walk on Duncan. The most secure way is to return to our early anthropoidal instincts and use all fours. Despite all precautions, one will emerge from the climb well scratched by thorn and rock, whatever method one uses to guard hands and feet. Thorns and spines are ubiquitous. However, the climb itself did not seem to be so difficult, for every feet few I would stop and examine the dry shrubs for termites, of which Duncan has a full quota. Christine, the botanist, collected the thorny branches at 500 feet altitude, while the rest of the party climbed ahead. At the summit we stopped to survey the Galápagean panorama. The sun had by now broken through the heavy *garua* and the sea took on a greenish-blue tone. All the islands became visible. Directly north was little Jervis, twelve miles away and our next destination. James Island stood out in high relief from the sea. Eight miles to the north-west was Indefatigable, the heavy mists rolling over its crest like steam rising from a plum pudding. Close up to the shore, on its western side, were the small five islets that are named Guy Fawkes' Islands.

The young inexperienced sea-scouts suffered considerably from torn flesh and scratches before we got to the top. From this part the island divided itself into two or three craters about 800 feet below. The best course

to pursue was to drop down the sides of this precipice, which was one of the walls of a volcano. Each of us carried our own water ration and food, and we agreed on set signals, for one can be easily lost on the Galápagos. After three hours' climb and descent we reached the rather level floor of the extinct crater. There I spread out the young men as I had on Hood Island, and we marched forward inspecting every rock, crevice, grass, for tortoises. When and if one was found, the finder was to shout and we were all to return to that place. For five hours we combed the whole length of the island. Finally, in the afternoon, a shout was raised and passed on from man to man, until we all edged to where the call originated. A tortoise had been found. It was a rather large male with a curiously dented shell. The Ehippian Duncan tortoise is found on no other island. If it were placed next to the tortoise of Indefatigable the inexperienced zoologist would not believe they came from the same archipelago. The Duncan tortoise does not grow very large, probably because the cactus, while in quantity, is covered with lichens and moss, and is less developed than the cactus of the larger islands. This specimen of the Duncan tortoise, the only one we found, had a deep wound in its front left leg. It looked as if it had been set upon by the rats (on Duncan they are the only enemy; there is neither goat, man, nor dog), the sore was deep, and I felt that unless it was given care the tortoise would die. I decided to take it back to the ship, although I am opposed to removing tortoises from their native habitats since they never breed in captivity.

In returning to the shore we passed from one crater to another. Toward the eastern end of the island we descended 150 feet to still another crater which supported not a living thing. It was a mile in width and dry trees were its only arborescent vegetation. Fires smouldered in the dead branches on the ground and the soil was so soft it gave way at every step. After a day's walking over the island, this last part of the trek was

extremely fatiguing, and, in addition, we had to take turns carrying the heavy tortoise on our backs. Then we had to climb out of the crater's mouth and begin the long descent to the sea. Boats were sent from the *Stranger* at our signal. I could really appreciate the comforts of a modern vessel after that day's labours.

JERVIS ISLAND

In the morning, on the way to James, we stood off from little Jervis Island. A small island as Galápagos Islands go, Jervis could be placed within one of the craters of Albemarle. Half the size of Duncan, Jervis is covered with red lava blocks and ash, but it is a veritable park in comparison with Duncan. The tortoise statisticians left first and proceeded up the slope guided by Truviño.

Back of the beach there is a large salt-water lagoon, where a flock of flamingoes were making their stately way. The flamingo is the only really tropical bird to be found on this volcanic archipelago lying on the Equator, and, with the one exception of the vermilion fly-catcher, supplies the only note of colour in the whole group of islands. It is not common to Jervis alone. Flamingo colonies are found on the larger islands of James, Indefatigable, Charles, and Albemarle. The flamingoes of Jervis seem unusually beautiful because they are seen there against a background of verdure.

Unlike the other islands, the sand of Jervis has a warm chocolate tone. Arriving in the morning, we saw the last bits of mist rising from the top of Jervis mountain. The beach, three metres back from the water, is covered with green succulents that hide the flamingoes' habitat. Eagerly, yet with extreme stealth, we parted the green growth and peered into the little salt pond, which is the universal abode of flamingoes the world over. We felt like 'Alice through the looking-glass,' as a score of flamingoes paraded slowly by. The rosy-hued birds, a metre in height, were foraging for little salt-water sprouts, some moving along with their heads

entirely below water, so that only a round pink sphere was visible moving along the surface. From the other side of the pond, which was surrounded by giant cactus trees, the island rose straight up for a thousand feet.

In order to photograph the birds more clearly we came out into the open, whereupon the whole flock flapped their wings, raised their bodies sufficiently to the surface to use their legs, and then partly running, partly flying, took off in beautiful formation. At the second time around the pond, one part of the flock continued flying, the others came down in the water almost opposite to where we were standing. Again we moved, and again the birds went through the same performance. This seemed very curious, for the dozen flamingoes that came down walked to the opposite side, always gravitating toward a small screened bank. I wondered. Eggs? When we moved carefully to the other side, the dozen flamingoes again rose, took their way around the lagoon, came down closely to the screened area, and walked slowly but deliberately away when we arrived. On a small lava knoll I spied a conical mud tower, and thereon lay an egg! I searched farther, another tower, and still another! We made our way to the spot and there before us was the flamingo rookery with almost a score of large eggs in the process of being hatched. While my wife filmed the whole scene of the egg-mounds, I was engaged in making a detailed photographic study of one. I was carefully turning the egg for a better highlight, when I was startled by a baleful chirp within. Simultaneously a bit of the shell was chipped off. We were in good fortune.

Setting our cameras in focus we waited the baby flamingo's debut. One hour—two hours, and the hole made was scarcely larger than a five-cent piece. It occurred to me that so long as we persisted in staying at the nest while the hatching was in progress, the mother flamingo was denied her part in the coming-out party. Moreover, such an action placed the life of the little bird in jeopardy, wherewith I elected myself to

play the flamingo's midwife. For instruments in this accouchement, I had only my forceps, but they proved to be quite the correct thing. Bit by bit the shell was broken, and either from distress or encouragement, our charge within gave periodical chirps. One has to go slowly as the bird cannot be expelled quickly but must adjust itself to its new ethereal environment. I would stop occasionally to photograph the process, and allow the contortions of the little flamingo to break away part of the shell also. At last I was rewarded in this avimanumission by seeing the bird eject itself from the half of the egg that remained. With a final chirp, it shook off the bits of shell adhering to its feathers, and, white as a ball of cotton, lay on the conical earth mound.

After we had built a screen of mangrove, the prospective mothers returned to their nests. Timidly they came, chaffing one another with their pink beaks. They seemed slightly irritable, and vented their nervousness, because of our presence, on their fellow flamingoes. After a good deal of bickering, the flamingoes each approached her respective mound with egg, and went through the sitting-on-the-egg ritual. It was a superb picture; the pink birds walking solemnly about with the whole volcanic blackness of the island as a background. Occasionally one of the birds would rise to its full height and flap its wings, when the black underpinnings presented a remarkable contrast to the rest of the roseate body.

The sitting-on-the-egg is a remarkable ceremony, more remarkable in that the birds have been able to surmount the difficulties of their long, ungainly legs. The nests are built of mud, twelve to fourteen inches from the ground, constructed in a conical mound-form. The mother bird approaches the nest, shakes one of its webbed feet, and places it on the edge in the nest. Then it raises itself on that one leg, sometimes placing its beak on the other side of the nest to balance, and shakes the other leg to free it of water and other foreign material. Having both feet on the edge of

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the nest, it preens its feathers, dislodges a tick here and there, and turns its cork-screw neck in every gyration known to a flamingo. Suddenly it places its beak on the edge of the nest and lowers itself on to the egg. Plop! The force of the whole body falls on to the egg which, astonishingly enough, does not break.

For some hours we sat observing the colony and taking pictures of these birds' mannerisms. The flamingo whose chick was hatched during her absence, seemed not the least perturbed to have the whole thing done behind her back. She, too, mounted the nest and squatted on her chick, and the last thing we heard was the chirping of the little flamingo and the answering quacks of its mother.

JAMES ISLAND

It was only a short sail to James Island, where we entered the large bay on the western side. A lagoon, harbouring flamingoes, is directly behind the beach as at Jervis, but the colony is small and disorganized, due, no doubt, to the presence on James (one of the big islands) of pigs, cats, and dogs, which eat bird eggs. Gulls and frigate birds kept up a raucous crying as we disembarked.

An entirely futile day was given to the search for a tortoise. From evidence found by Truviño and myself I would believe that there are still a few of them on the islands though we saw none. We moved next to the harbour near Albany Island, the famed resort of the buccaneers. On the maps of the Galápagos that I had uncovered at the British Museum, the detail of James Isle shows an anchor behind Albany Island; there water could be procured, and there the buccaneers made their caches of flour and other foods to be picked up later when needed. It was one of the few islands where the buccaneers found water near to the sea. When Captain Colnett was there in 1793 he found casks, broken swords of seventeenth-century craftsmanship, and other indications that pointed to a pro-

longed habitation by the buccaneers. Melville said they repaired to James after the pirate wars, 'to say their prayers, enjoy their free and easies, count their crackers from the casks, their doubloons from the keg, and measure their silks of Asia with Long Toledos for their yard sticks.'

ABINGDON ISLAND

The most northern of the islands (with the exception of the two small islands, Culpepper and Wenman, two hundred miles north) is the Earl of Abingdon's Island, now called merely Abingdon. It is about the size of Hood, being approximately ten miles across at its greatest width. On the weather side there is a two and a half knot current that has eaten into the side of the island, making a sheer cliff of 1000 feet, such as occurs nowhere else in the archipelago. The island is difficult to land upon, and again the *Stranger* had to stand out to sea. This island, too, has its unique species of tortoise, differing from the tortoise of all the other islands; it is the most extreme of the saddle-backed type and has a curious flange over the neck of the shell. The head of the reptile is dull yellow. On the shores of Abingdon was the trunk of an enormous tree, 100 feet in length by two and a half in diameter. There were also seeds of vines, which are called on the Ecuadorian coast *ojo de venado* (deer's eye). Truviño said that he had seen such seeds before only on the coast of Manabi, which was his home. This is very significant: if seeds and an enormous tree can be thrown up on the shore, then faunal species can be brought on the full force of the current.

Abingdon has craters on the northern end of the island which are still jagged, gaping, and smouldering. Volcanic activity has been stilled on this island for only a short time. It still continues on Albemarle and Narborough, occurring while we were on those islands. The character of the Abingdon flora is typically Galápaguan. Like all the islands, it has a specimen of plant

that is found only there and nowhere else on the Pacific side of Mexico and South America.

There were twenty in the party that made a survey of the tortoises of Abingdon. In the first 300 feet of altitude, we walked over massive clinkers with small delicate cactus growing between the soiless lava blocks. Then we entered the cactus zone. Directly in front of Abingdon was Bindloe Island, standing out marvelously clear as it was only ten miles to the south-east. On that island, scarcely a year before, the bodies of a Norwegian and a German were found mummified on the beach; their discovery led to the unfolding of the famous Galápagos mysteries of Dr. Ritter, *et al.*

At 800 feet of altitude we entered into a region of rich grass, great cactus, and leafed trees, clothed with long strands of *orchilla* moss. At this spot Commander Cookson, of H.M.S. *Petrel*, discovered the Abingdon tortoise in 1876 and sent it to England for identification. Here, too, occurred a famous experiment by Captain Basil Hall in 1822. He had brought with him Kater's pendulum, a valuable contribution to physics as well as cartographic accuracy, and on the hills of the volcanoes of Abingdon various experiments were made.

The two highest peaks of Abingdon reach to 1800 feet. The island is quite beautiful, if one can apply that adjective to the Galápagos scene. It has never known man for any length of time. In consequence, there are no rats, goats, mules, pigs, or dogs, to plague the native fauna of the islands, but still the tortoises have disappeared—not wholly, for while we found no tortoises, Truviño and I found nests in the high grass, as well as freshly laid dung, that spoke of their presence. The *Stranger* could not keep steaming back and forth too long, and so we had to abandon the search after a day. In circling the island, I noticed that its bird life is scant; there are no salt ponds, hence there are neither duck nor flamingo, gulls are scarce, the pelican is less numerous, and I saw few sea iguanas.

From Abingdon to the north point of Albemarle,

whither we were shaping our course, the water has a depth of 1600 fathoms, i.e., a little less than 7200 feet, yet the tortoises of north Albemarle and Abingdon are similar, as are the plants which both islands have in common. Is this the result of land connection? I doubt it; there was not a plant at Abingdon that could not have been brought there by wind or current.

ALBEMARLE

As we sailed around the tip of Albemarle, I sighted Redondo Rock, and Captain Lewis shaped the course of the vessel toward it so that I might have a look at it. On the pirates' map of the islands it is the only bit of land that has retained its Spanish name, an appropriate one, for Redondo means 'round.' It is 200 feet high and barren, about a quarter of a mile in circumference, and is visible for eight or more miles. We sailed about it, and I swept the rock with my glasses to see myriads of bird fauna rise therefrom. Whales used to gather in the depths about the rock in the early days, and many an Old American whaler remembers it. The author of *Moby Dick* has left a description of it, a description both realistic and allegorical. 'If you seek,' says Herman Melville, 'to ascend Rock Redondo, take the following prescription. Go three voyages round the world as a main-royalman of the tallest frigate that floats, then serve a year or two apprenticeship to the guides who conduct strangers up the Peak of Teneriffe, and as many more, respectively, to a rope-dancer, an Indian juggler, and a chamois. On it we would stand ten miles from the Equator. Yonder to the east some six hundred miles lies the continent, this rock being just about on the parallel of Quito.'

Albemarle is a giant hunk of cinder from one tip to the other, and the largest island of the archipelago. It is eighty-seven miles long and has five principal volcanoes, two of which are active. Its shape is like an inverted 'L.' The five volcanoes, the one at the southern point being over 5000 feet high, are spaced almost

equally. Study of the form and structure of the island shows that these five volcanoes kept pouring out lava in spasmodic eruptions, and after millions of years built up the whole island. With the active assistance of hundreds of fumaroles, vents and secondary craters vomiting out lava, they coalesced into one large island. Lawrence John Chubb, a very capable geologist who visited Albemarle, finds some evidence of elevation. This is a complete reversal of the unconsidered judgment of those who hypothesized a land connection.

There is further evidence for the coalescing of Albemarle: there are five distinct species of land tortoise. Formerly confined each to its own isolated island for millions of years, each species acquired certain characteristics and modifications from the original form. Then when the five volcanic islets coalesced, the tortoises were free to wander through the length and breadth of the large island, and so the five species became somewhat scattered. Albemarle is the only island of the whole group that possesses more than one species of tortoise and from what we know of birds and plants of the rest of the Galápagos, the development of these species could have been accomplished only through millions of years of isolation. Thus, zoology joins hands with geology to confirm some details of the origin of the Galápagos.

As befits such a large island, Albemarle possesses many unique features. Besides the tortoises there are numerous flamingo rookeries, land iguanas, sea iguanas, ducks, teals, herons and gulls. And far above the arid desert slopes there are great mist-forests festooned with vines and orchids. In addition, it has, on the western side, two unique birds, the penguin and the flightless cormorant. Penguins on the Equator are easily explained, because they also exist along the coast of Chile and Peru. Caught in the force of the current, some were brought to the Galápagos and, as they would find it impossible to return against a two to four knot current, they remained, and they, too, became modified in their

structure. They are, I believe, the smallest of the penguins. Melville was not kind to our interesting birds :

'What outlandish birds are these? Erect as men, but hardly as symmetrical . . . their bodies are grotesquely misshapened, their bills short, their feet seemingly legless; while the members at their sides are neither fin, wing nor arm. . . . Though dabbling in all three elements, and indeed possessing some rudimental claims to all, the penguin is at home in none. On land it stumps; afloat it sculls; in the air it flops.'

No one has ever seen a penguin rookery on the Galápagos Islands, or, if they have, they have not reported it. At any rate, their numbers have been severely thinned. For once we can blame neither pirate nor whaler; the blame falls on scientists and yachtsmen who have taken away hundreds of them alive or dead. Now the penguin and, in fact, most of the Galápagos species, do not breed in captivity. What we need—and this is where zoology is very backward—are observers willing to sit down and record the habits of animals in their own natural habitat, without killing them. Anyone can sit, as we did along the jagged shores of Albemarle, and see the little penguins swim up, eyeing the intruder with natural curiosity, but betraying no fear. Their confidence is a very sorry commentary on man's belief in his right to kill. Man has transformed the Galápagos Islands (and this is not the only example in the world) from a natural zoological park to a land of fossils overrun by the creatures he has placed there: wild dogs, pigs, and cats.

Charles Darwin did not see the penguin, nor did he know of the flightless cormorant which was not discovered till 1907. This peculiar bird, the only species of its type in existence, illustrates variation in adaptation to environment. In the water these birds look like any other cormorant. They exist in millions along the

Peruvian and Chilean coast, and far up the rivers of Ecuador. The ordinary cormorant and the booby are the birds that have made the famed 'guano island' of Peru. The Galápagos cormorant has, with the passage of time, lost its power of flight; its wings are only casual, hypertrophied stumps, with sparse feathers. Melville would have been more exact if he had made about the flightless cormorant, the quip regarding the penguin: '... on the land it stumps, afloat it sculls; in the air it flops.' ... The cormorant shares its habitat with the sea iguanas, and the penguins. To see these bizarre sea iguanas nesting peacefully with the cormorant, making no attempt at struggle, shows what the absence of man and predatory animals does for the Galápagos species. The cormorant lives on fish; the sea iguana on algæ. There is plenty for all, thanks to the bountiful sea; there is little room for antagonisms, they are confined to islands from which they cannot escape, so for millions of years they have tolerated each other. A very pertinent symbol for man himself.

When swimming, the cormorant does not use its wing stumps to propel itself. These are folded like the legs of the sea iguana, close to its body. Its severely accentuated web feet send it whirling through the water. It is interesting to watch the effects of divergent evolution. The penguin and cormorant each move through the water with equal celerity; yet the cormorant depends on its web feet, the penguin entirely on its paddle-like wings. And, what is more interesting, the flightless cormorant has no counterpart elsewhere, and the penguin is the only representative of its great family in the tropics.

These birds are also joining that long melancholy parade of extinct animals. Again the burden falls on the acquisitive sense of the collectors and yachtsmen. They threaten to exterminate the cormorant; his days are numbered. And for what reason? Merely that someone returning from a short trip might be able to insert in his reports that he secured so many skins of the

rare cormorant. Hundreds of skins of this bird are in collections in various museums of the world. Stuffed birds can teach one very little. What the world of science needs is living birds for study in their natural environment. Only in this way can we learn why they are as they are.

Man is joined in this rape of the species by his friend, gone berserk, the wild dogs of Albemarle. Scattered through the mountains and along the shores are thousands of dogs which attack turtles, birds, or cattle. They are large dogs, looking like a cross between shepherds and collies, with grey eyes like wolves. Travelling in packs they attack tortoises, rob the eggs from the flamingo and cormorant nests, search down and slaughter penguins and cormorants, and even swim out to sea after the sea iguana. Captain Lewis tells me that some of the dogs he has shot have begun to develop web feet from their habits. If this is true, it would be a very interesting subject of study to a zoologist interested in aberrations.

Across from Albemarle, is Narborough, which has a most active volcano, a very high central peak of 4500 feet. In general, the island is round and about the size of Indefatigable. But it is bare and menacing with its fresh lava streams and great volcanic bubbles. For a description of it, I must turn again to Melville :

'Albemarle opens its mouth toward the setting sun. His distended jaws are a great bay in which Narborough, volcanic Narborough, lies in the black jaws of Albemarle, like a wolf's red tongue in his open mouth.'

Our trip aboard the M.S. *Stranger* was nearing its end ; for two weeks we had been the guests of a very charming host and hostess who, appreciating my profound interest in the situation of the fauna, went far out of their way that I might, with my new-found assistants, have the opportunity of a personal survey of the islands. The survey was much too hurried : I should have liked

to linger on some of the islands, studying patiently, minutely, the phenomena as I had on Indefatigable and Barrington; but I was grateful for the opportunity that Captain Lewis had given me. We stopped at the settlement called Villamil, at the southern tip of Albe-marle, and saw the poor human beings who made up this colony, unhappy, destitute, living a mere step from pure savagery. And then again we were at Indefatigable.

Captain Lewis kindly loaded us with things we could never have procured on the island, in addition to small things that we could give as presents to our Norwegian friends, for Christmas was only ten days away. Then the great white boat turned upon its keel and sailed away out of Academy Bay.

CHAPTER XX

JOURNEY'S END

SUMMER was in full flower at the Galápagos in January; the cactus was in bloom, the arborescent cereus had lovely golden flowers to which the meagre insect fauna paid court, the desert perennials that depend on moisture came to life as the rains drenched the landscape, and the sun would come out immediately afterwards. Overnight, it seemed, small flowers came out on the leafless plants and desert annuals grew into fine plants.

Faunal life, too, repeated its ever recurring cycle. All species were laying eggs; the crustaceans, the crayfish, carried their egg-horde beneath their tails; the fish that we caught for food had a plentiful supply; the sea turtles pulled themselves painfully up to the beach, dug their holes and buried thousands of eggs; the female sea iguanas became very restless; birds everywhere were laying their eggs. Christine's curly hair was set upon by the little vermilion fly-catcher, who thought it an excellent material for a nest. It followed Christine everywhere, hovering over her and pulling at her locks.

In our camp, the sea iguanas were laying also. I had a number of them in a large cage where I could observe them; as I sat summing up, rounding out my voluminous notes, the land iguanas were laying, and I could stop my work and record, photographically, some point in their biology hitherto overlooked, like so many things on the Galápagos, because observers have always been in a hurry.

When the egg-laying time approached, and 'labour' began to set in, the female would restlessly move in the

cage, scrape the ground, and finding she could not dig in that spot, suddenly turn in rage on the other inhabitants of the cage. Then a strange look would come into her eyes, and she would become quiescent. Later she would begin to move her hind quarters and eject an egg, and then another and another—eggs twice the size of a hen's egg, with a thick, pliable membrane. A small land iguana, not over six pounds, would lay as many as eight large eggs. I scarcely knew where she could store such a number without their being apparent.

All through January and part of February, there was the 'summing up'—new notes to gather, new plants to collect, a general rounding up of details to make our Galápagos sojourn complete. The day neared for our departure. As usual, the old schooner, *San Cristóbal*, behind schedule, limped into Academy Bay.

Most of the Norwegians had suddenly decided to quit the island. All came down with the things they had brought. One Swede had even brought a bicycle! We crowded on to the *San Cristóbal*, for all knew that there would not be another sailing for months. On the small forty-eight foot vessel was the crew of ten, twenty passengers, and more to be picked up at Chatham. There were only two berths on the boat. In the holds were badly prepared cow-hide, salted codfish, and nauseous blocks of sulphur. On the deck were two mules tied to the mainmast; behind them lay a gangrenous dying man, who mixed the horror of his death rattles with the braying of the mules. After so many idyllic, pleasant months on the Galápagos, we were thrust into this stench and confusion. To make matters worse, we knew that the trip might take as long as three weeks, perhaps a month.

Christine had been running a fever for some days and it now broke out afresh; it was a relapse into malaria. There are no malaria-carrying mosquitoes on the Galápagos, no typhoid, no dysentery, no disease of any sort, but Christine still retained parasites in her blood from the mainland. Such was the prospect of our

voyage back to the continent. After an awful night, in which it rained and we who were on deck were soaked to the skin, the *San Cristóbal* moved into Chatham, there to lay over for a few days.

That same afternoon a grey boat came over the horizon; we wondered what this vessel was, and on inquiry were told it must be one of the vessels of the American Navy which were manœuvring in the Galápagos waters. Later, the vessel sent a boat ashore, and out stepped three smartly-attired American Navy officers. They seemed surprised and pleased to meet Americans, and I was able to satisfy their curiosity about the islands. The fleet, with Admiral Horn of the cruiser U.S.S. *Ranger* commanding, was in the archipelago with a few aircraft carriers and numerous aircraft. This vessel, the U.S.S. *Lapwing*, was the aircraft tender.

In the afternoon the commander of the vessel, through his warrant officers, invited us aboard, and begged that we act as interpreters to the commandante of the islands. During our conversations with the commander of the ship, Lieutenant Clyde Smith, he learned that Christine was suffering from malarial fever. He pondered, withdrew, and then sent a message to Admiral Horn, informing him of the details. They asked the latter's permission to take us aboard the U.S.S. *Lapwing*, as it was going to the mainland. An hour passed, and Lieutenant Smith entered the saloon with a twinkle in his eye. In mockery he bowed and said:

"The Admiral sends his compliments and orders that the U.S.S. *Lapwing*, Lieutenant Smith commanding, remove Mr. and Mrs. von Hagen—and dump them ashore in Ecuador."

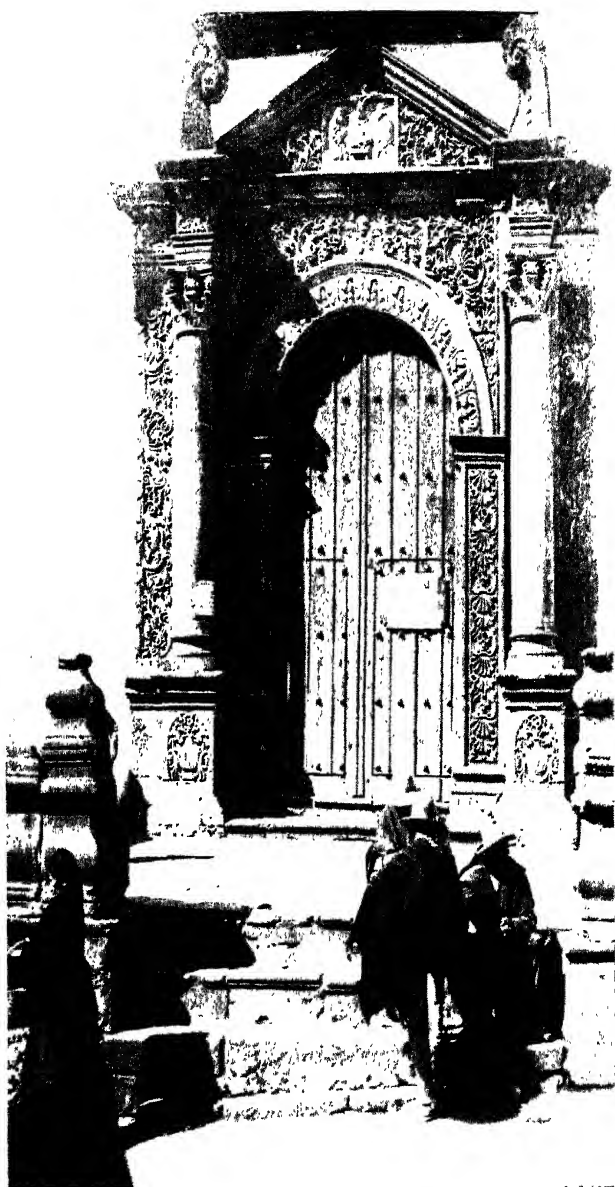
For a moment we were spellbound. Then we both poured out our incoherent gratitude. "I have," Lieutenant Smith continued, "a few minutes to wait. Can you put your things on board at once?"

A Navy boat was dispatched and I waved five-sucré bills in front of the eyes of the indolent sailors of the *San Cristóbal*.

"*Mira Amigos*. . . . Look here . . . a five-sucre bill to everyone if they get out all my baggage in ten minutes." Latin-American procrastination disappeared as if by magic. Out tumbled our plant collections, insect collections, gear, clothes, and in ten minutes we were aboard the U.S.S. *Lapwing* and cleared for Ecuador.



MEDIEVAL QUITO: SCENE IN THE COVENTO DE LA
MERCED



QUITO, A CITY OF CHURCHES, IS SUPERBLY ORNAMENTED WITH BEAUTIFULLY CARVED DOORS

CHAPTER XXI

QUITO—NAVEL OF THE WORLD

WHILE at the Galápagos Islands I had resolved that I would start and carry to its end—no matter how long-drawn-out it might be—a campaign to make the islands into an animal sanctuary to prevent the complete extinction of the fauna.

We landed in Guayaquil in February in the middle of the rainy season. The city had lost its pleasant, easy aspect, being deluged during the day, and more often the night, with incredible downpours, which flooded the streets until the sewers were unable to carry off the water fast enough. The Rio Guayas reached flood stage and the salt water estuaries that come up from the sea to the back of Guayaquil overflowed. A plague of mosquitoes buzzed about during the day, while at night, attracted by the arc-lamps, came myriads of *grillos*, giant water-bugs, and two-and-a-half-inch flying cockroaches. In the morning the streets were filled with their dead bodies. Swarming termites issued from wooden doors, chairs, and books, the winged sexual forms de-alating themselves in front of my writing-desk and crazily chasing each other around until a male selected a female.

We had wanted to entrain for Quito at once. Rumour had got about that the railroad tracks had been washed out (a usual occurrence during the rainy season), but if the rumour had any foundation the railroad officials refused to recognize it, and announced that transportation was to continue as usual.

In darkness we arose, as we had done so many times before, ready to cross the river to Durán for our trip to

Quito, which was now no longer an event. Our tickets had been purchased two days previously, we had reserved seats in the observation car (which contains only ten chairs) and we had progressed enough in experience to have a lunch put up for us by one of the restaurants of Guayaquil.

Proceeding at dawn down the wet streets of Guayaquil, we dodged the spasmodic downpours by ducking under the overhanging eaves of the buildings. The sensation of squashing the heaps of soft-bodied *grillos* that covered the streets brought no quiver from Christine. Nor did we pay much attention to the guard at the ferry who insisted that we hurry as the Durán boat would leave in five minutes—*à-la-punta*—that is on the dot. We knew better. Casually, unhurriedly we boarded the boat. When it had crossed and safely anchored on the other side, we sat apart from the surging crowd reading the morning Guayaquil papers. When the last bit of struggling humanity had fought its way off, we made our way to the seats reserved for us.

Obviously the rumours filling the city that the rails had been washed out had not reached the railwaymen. After we had waited half an hour past departure time and the train still did not move, I casually asked the conductor when we would leave.

"Have you not heard, señor, that the train will not go to-day? A washout has occurred in the tracks ahead."

"And—Señor Conductor, how were we to know if you do not tell us?"

"Why," and he seemed much surprised as he answered, "everyone in Guayaquil knows that the tracks are washed out!"

"Apparently not," I replied, "as the train is filled with expectant passengers. When will the train run? To-morrow? One week? Two?"

The conductor raised his shoulders and uttered the Latin-American shibboleth: "*Quien sabe*—who knows?"

There was nothing left for us to do but return to Guayaquil and sheepishly re-engage our rooms in the

face of our friends (who had risen and breakfasted at a more 'civilized' hour) and who had maintained all along that we would not get away.

Each day I inquired at the station when the train would leave and each day I was told by the manager himself that assuredly the train would go on the following day. And each day it did not. Meanwhile Guayaquil was becoming decidedly noisome. The deluge had broken the single water-main that supplied the one hundred thousand people of the city and only a part of the water reached its destination. Finally, the supply was completely shut off. The stores did a land office business in bottled water. People bathed in, shaved in, and drank Vichy water. What the poor did for liquid, I do not know. Toilets remained unflushed, dysentery was becoming epidemic.

At last the rumour spread one night that the train would really leave next day, but the railroad officials had no use for rumour and for once deserted their contention: the train would not run. But the wife of the Secretary of the American Legation, who was also going to Quito, insisted that the rumour of the people is a better indication of true information than the official's—and she was right. At its appointed hour the train began to roll toward the mountains, but ever so slowly, for the tracks were completely hidden by the water of the overflowing tributaries of the Rio Guayas. Bridges that were high above the river in the dry season were now covered with water.

We had, like the Ecuadorians, become completely calloused to such extraordinary phenomena, and when we had exhausted the newspapers and our mail from home, we settled down to a few rubbers of bridge in the very comfortable chair-car, a convenience that can be purchased for a modest expenditure of an additional six sucres, or sixty cents, to the fare of \$7.50 for the whole trip to Quito.

Somewhere along the line, at about kilometre seventy-five, the conductor announced that the train would go

no farther. We were to walk across the section that was washed out to another train. A young American woman, *en route* to the capital with a six-weeks-old baby, was greatly upset about the safety of the child during the transfer, so I jumped off to ascertain exactly what were the difficulties.

The trains were separated by a hiatus of about a quarter of a mile and that gap was filled by the rampaging Rio Chan Chan, which was merely a brook under normal conditions. Two hundred yards of track had been washed away along with the road bed, and little was left except the bare mountain cliff and some dangling bits of rail and ties that somehow held on despite the undermining of the flood. Over this section the passengers precariously picked their way—workmen hurried by—*moxos* carried the freight from one train to the other.

Under the circumstances the young woman could not carry her baby nor could her Indian nurse, so it fell upon me to get the child across. It was a bit of a contrast from carrying iguanas and tortoises on the Galápagos to running over a wrecked railroad bed with a young baby; especially someone else's baby. A ticklish position for anyone, with the workmen clumping along swinging picks and shovels. I firmly grasped the baby at each end as I would have a football, and holding it in front of me, I plunged into the human maelstrom, jumping from tie to tie, swinging the baby from side to side to avoid collision with the workers, while the mother nervously brought up the rear.

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I had promised Christine that she would find Quito different from the other cities of Ecuador, and the first indication of its metropolitan character was in its principal hotel.

The Hotel Metropolitano, operated by a Jew from Gibraltar, had an elevator, the only one in the highlands; the servants were uniformed, and the prices were *fija*,

that is 'fixed,' meaning that there was no bargaining. That these things are noteworthy is a commentary on the provincialism of the rest of Ecuador.

The appointments of the rooms were excellent and the food far above the average standards of Ecuador. Directly outside the hotel ran one of the several street-car lines. All this gave Christine (after our exhausting trip to Quito) a will to explore.

Our acclimatization (after living at sea-level at the Galápagos) at the high altitude of 9300 feet proceeded slowly. The nip of the morning temperature of fifty-two degrees, which seldom varies the year round, produced a noticeable spirit in the people and in us, once we became accustomed to it.

Although the principal streets of the capital are macadamized, in the outlying zones they are of rough cobble-stones and are incredibly narrow and winding. Only a narrow space is allowed for the sidewalks, and as we walked along I had constantly to step off into the gutter to avoid bumping into other pedestrians. A *paseo* or walk involved constant manœuvrings with grandiloquent expressions of concern by the *Quiteños*, who recognized us as foreigners—a lifting of hats, deep bows—and then we would continue again, only to pull up short as an Indian balancing a large desk on his back would suddenly bounce out of a doorway.

The Indians monopolize the gutters and lesser streets (they are so ruthlessly pushed off the sidewalks that they rarely bother to walk on them), taking the place of dray-horses, for they will carry anything: beds, pianos, rocks, tables, and every other burden usually reserved for trucks in our country.

Everywhere we went we were conscious of the priests. Quito, with its long religious tradition, boasts of being the 'Republic of the Heart of Jesus,' and has innumerable orders of monks and padres. The white-cowled Mercedes monks trod beside the Oblatos, and Jesuits, whose headgear were black *birettas*, chatted amiably with Franciscans. We saw so many that

Christine remarked that each one of the one hundred and twenty thousand inhabitants of Quito must have a personal father confessor.

The Hotel Metropolitano faces the Plaza de Independencia, where the heart of Ecuador beats, with the Municipal Cabildo (city hall), the Cathedral of Quito, the Governmental Palace, and the Edifice of the Archbishop, the four essentials in colonial Spain, as well as in modern Ecuador, flanked on the four sides of this central plaza.

Like Cuenca, Quito is a city of shops. Every nook in every building is occupied by a stationer or seller of small trifles, as well as others who offer woollens, cotton, and thread. All purchases are insignificant. We found that we had to buy aspirin in single tablets, pins by the two and three, butter and sugar by the gram, and corn-starch in one ounce packages. Everything was done on a small, petty scale, and if an American manufacturer's agent could walk these streets he would soon see that to sell more merchandise to South Americans, the products must be broken down to the smallest possible units.

In the streets the lisping legions of Indians, clad in bright red and green ponchos, hurried along to market amid the shouts of the street vendors. As usual the men of the higher Cholo class dressed in black, as they did in Cuenca, and occasionally there passed in the throng a young man of the upper class, dressed in tweeds, or a comely woman gowned in the latest fashion. Well-groomed officers in swank grey-blue uniforms with swords and capes, assumed histrionic poses as they leaned against the building ogling the señoritas. Most of them were on leave to the capital from a monotonous sojourn in the Upper Amazon, or back from a garrison in one of the outlying provinces.

Many changes have come over Quito in the last fifteen years, and the observations of travellers who described the city then can no longer be followed, for improvements have been general. Gone are the water-

carriers who every morning cluttered the plazas with their ten-gallon earthen-jars waiting to bring water to the households by which they were employed. Now most of the houses have running water brought to them in closed conduits.

Public toilets have even been installed in Quito, which is an event for Ecuador. Although toilets are still not considered necessary equipment for homes among the common people, the maintenance of public hygiene in the past years has taken from Quito the distinction Frederick Hassurek (our Minister to Ecuador during Lincoln's time) gave it, as one of the filthiest capitals in Christendom.

'Men,' he wrote, 'women, and children of all ages and colours may be seen in the middle of the street in broad daylight, making privies of the most public thoroughfares, and while thus engaged they will stare into the faces of the passers-by with a shamelessness that beggars description.'

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The real glory of Quito is in the superb architecture that the church-building fathers have left, and the Cathedral of San Francisco is a substantial testimonial to this glory. It is an example of Carlos V's exhortation to the Franciscanos to build a church and monastery 'worthy of the sons of God.' No sooner had Quito been founded than the Emperor sent a vast sum of money to erect the edifice that has lasted through all of Quito's earthquakes.

The façade of the Church of San Francisco is in simple Tuscan style. The structure is massive, but neatly turned, the central portion being crowned by two enormous steeples. Within, the ceiling, up to the termination of the narthex, is of stone and gilded wood. Chapels at the side are decorated in geometrical Moorish style, for the artists of the New World copied faithfully from their Old World Models, while at the end is an immense altar of carved wood covered with gold-leaf,

highly decorative in the flickering light of thousands of burning tapers, although a little gaudy for our taste.

Besides the donations of Carlos V, the Cathedral of San Francisco is said to owe its rapid growth and richness to the lost treasures of the last Inca, Atahualpa, a portion of which, according to monkish legend, was recovered in a strange fashion.

When the Indians burned Quito on the approach of the Spaniards, the gold of the temple was buried by an Indian official named Haulca, assisted by his own son, Catuña. In the fighting that followed, Haulca was killed. The boy, Catuña, escaped, but was severely burned and suffered an injury to his spine that made him hunch-backed. A Spanish captain, Hernando Suárez, pitying the boy, and attracted by his intelligence, took him into his house and adopted him.

The Spanish captain, like the rest of the *conquistadores*, quickly lost his wealth in gambling, and became burdened with debts. Catuña then revealed that he knew where the treasure of the Inca was buried and extracted a promise from the Spaniard that he would not tell whence came his gold if the Indian boy obtained it. The Quitonians were puzzled by the sudden affluence of Suárez, but they could learn nothing of its origin. Suárez died in 1550 and having no children he made the crippled Indian boy, Catuña, his legal heir.

The authorities became alarmed when Catuña gave an immense amount of gold to the church of the Franciscans and the Inquisition was put to work on the Indian to discover the source of these riches. Catuña, on the rack, confessed that he received his gold from contact with the devil, and the soul of the little crippled Indian was forthwith exorcised to free it from the devil's toils. One of his persecutors remarked drolly: "If this horde of gold is one's reward for being in league with the devil, methinks I should be glad to be plagued forthwith."

The heads of the church intervened in the persecution of Catuña because of the pious use to which he had put

his treasure, and he was given his freedom. Upon his death, Catuña turned over to the church the fortune that is said to have built it.

On our fourth day in Quito we made our way toward the Jesuit Church, of the *Compania de Jesus*, but were prevented from entering at once by a funeral *cortège* drawn up in front. As the casket was carried out from the chapel the bells kept up a mournful cacophony like someone beating a broken boiler. The Indians who were in the nearby Plaza ran up, eager to see anything of colour, even a funeral.

A horse-drawn hearse, decorated with six large black plumes, was being driven by two Indians uniformed in coachmen's habits of the nineteenth century. The hearse moved slowly off followed by the chanters of the death litany. An Indian boy, ludicrous in an altar boy's white alb, with unwashed face, dishevelled hair, and dirty bare feet, led the procession, swinging a censer in front of the religious group which walked under a baldachin carried by other barefooted Indians.

The deceased (who had died only the night before, for the dead must be buried within twenty-four hours in Ecuador) must have ranked high in Quito society, for the chasuble of the priest was richly embroidered, and his chants, I learned from two onlookers behind me, were reserved only for a person of note.

Behind the priest came the mourners, almost all men, a solid body of black fedoras and black suits.

Funerals in Quito are big business and, by necessity, severely standardized; the quality of plumes that grace the hearse, the attire of the footmen, and the number of priests and altar boys, determine the cost of the *cortège*. I could hear the people around me rapidly calculating the expense involved. As one's relatives are legion, death is not a strange bedfellow in Quito—everyone has had sufficient experience in such things to know the cost.

Once the procession had passed we were free to enter the famous church which is considered one of the

outstanding examples of rococo architecture in the world.

The six columns on either side of the main entrance are of mixed Italian baroque and a distinctly Spanish-Moorish style known as the *Plasteresco*. The grey porphyry on which the façade has been executed was quarried in the Andes and, what is more remarkable, was almost wholly carved by Indian masons under the direction of the padres.

Within, the mural decorations follow the geometrical Moorish style. The magnificent ceiling is decorated with *motifs* of knots and aster stalactites, and the knot *motif*, in particular, runs wild throughout the vault of the church, raised in stucco relief and embellished with gold. Not an Indian *motif*, not one example of Incan simplicity has been used. The Indians copied the designs that the padres brought from Rome and Spain as faithfully as they repeated the Christian's prayers. It does not seem possible that the Spaniards could have been exposed so long to the Indian culture and not have been affected by it; but we must remember that the Spaniards, in all probability, fought against such influence. Decidedly in the minority, their solidarity as the ruling class could only continue if they not only adhered to their traditional Iberian culture but even augmented it, to save it from extinction in a world strange to them.

There has been a great deal of speculation on how much gold-leaf the interior of the church of *Compania de Jesus* contains. We North Americans are not the only people who think in terms of money. *Quiteños* like to point out the millions of dollars tied up in that church. A Jesuit, who acted as our cicerone, explained in guarded whispers that they had to be very careful with their parishioners, for they were always trying to carry off mementoes, or *muestras*, as he called it, of the gold-leaf.

He motioned us to follow him, and we picked our way through the kneeling Indians who were scattered among the pews, niches, and small chapels. Native tattered-demonialions, their clothes a hopeless jumble of rags

sewed one on top the other, knelt in passive rapture before the saints that lined the walls. I stopped once to look searchingly at an Indian whose face was the colour of tarnished copper. His stare was vacant, his eyes, small and black, with an expression much like that of a dead fish, were set in a small head held on by a bull-like neck, hyper-developed from the long habit of carrying heavy loads. From the thick lips (which gave testimony to his sulkiness), poured out religious recitations without the slightest visible effect on his intelligence—not a very pleasing commentary on his spiritual conversion (or is it?).

We followed the padre to the side of the church; as the Indians heard the slap of the sandals of the monk they moved quickly away. Although the light was dim it was very obvious that the surface of the wall had been changed, for where the gold-leaf remained, every bit of light was reflected. To our look of askance the priest said in a hoarse whisper :

“Our dear *pobrecitos*, the Indians, are very devout; they come to the church every day to pray, and the church owes its greatness to them because of their unquestioning faith, but some of God’s creatures do their praying close to the wall of the church, and while they grasp a rosary with their right hand, their left scrapes off the gold-leaf. They put, unfortunately, too explicit an interpretation on the Scriptures: ‘Never let thy right hand know what thy left hand doeth.’

“And so we have had to cover the rest of the wall with gilt paint.”

After our visit to the Compania de Jesus church, Christine had perforce to leave me to continue the exploration of the churches alone. Many of the fine examples of colonial architecture lie behind the great wooden doors of the monasteries which are closed to women, and henceforth it becomes a man’s world.

To my mind the finest structure in Quito is the Convento de La Merced, which is only a short block from the main Plaza. The *Quiteños*, as well as most

of the tourists, prefer to heap this distinction on the rococo Jesuit Church, but I feel that they are more seduced by the wealth of its swirling, superficial design than by the essentials of its architecture.

La Merced, like so many things in Quito, disarms you completely by its exterior. Bare, blank, massive, facing on one of the typical narrow, cobbled side streets, there is nothing to indicate what is within. By its very bareness I would have been put off, until I recalled that some of the most delightful patio gardens in the city are hidden by what appears to be a tumbled-down building.

I pulled the bell-rope that hung outside a great wooden door. Presently a white-cowled, ascetic face peered out at me from a small window in the door, in the fashion of the blind pigs of prohibition days. I asked his permission to see the interior of the monastery. Without a word he slammed the small door. There was a rattling of bolts and then the big door swung open.

Outside I had had some contact with the twentieth century, but when those great portals closed behind me I was transported back to the period of the Renaissance; not alone by my own thoughts, but by the scene within the courtyard. These monks had held back the hand of time. There were no signs of decay within to indicate that three centuries had passed since the monastery was erected.

In a graceful series of arches the building formed itself about the square, crowned by a towering white cupola, roofed with green-bronze tile. Dominating the courtyard was a fountain: a classical Poseidon, carved on a large stone sea-shell, sat holding a three-pronged spear—water poured from the mouths of Satyr heads, which formed the main basin, and typical Renaissance cherubs held up the shell from below. The whole fountain was a sculptural anachronism: Greek mythology used in a Renaissance fountain, in a courtyard of La Merced monks in lofty Quito, within a Moorish-Spanish colonial monastery, carved by the Indian descendants of the Incas.

I visited La Merced mainly to gain access to a room which I had been told was very interesting. Making inquiries of the white-robed monks who paced the patio telling their beads, I was directed to the Father Superior, whom I asked if I might see the suite of rooms which the Inspector-General of the Order, coming from the Old World to the New, had used when he visited Quito. With gracious hospitality the Father put aside his work and offered to see me to the rooms himself. I followed him up to the second floor, where, at one end of the convent, were heavily panelled doors. After some fumbling with the massive keys the padre pushed them open.

Inside were three rooms of moderate size—light streamed through narrow embrasures which pierced the thick walls. The walls were decorated and covered completely with muralistic portraits joined together with wreaths and garlands of flowers. The heavy furniture was of mahogany and walnut, and like everything of colonial times—substantial and dignified. The seats and backs of the chairs were covered with leather, ornately tooled. Around the sides of the rooms were superbly carved chests of solid mahogany with big silver locks. Everything in the rooms would have aroused the acquisitive instincts of an antiquarian.

Placed on the tables were droll, though well-conceived, polychromic statuettes, a type of sculpture essentially *Quiteño*, an art of the half-breed which had its origin in Quito before it spread to the other Spanish colonies.

In the schools set up by the Franciscans in 1535 the fervour of the new Indian converts found expression in these carved symbols. They developed their own style, so unique, that someone has suggested that these unknown communal carvers 'invented a new type of Immaculate Conception unknown to the Marian iconography.'

The Superior's room contained many delicate carvings of the Virgin, gilded and beautifully varnished, with

flowing robes decorated with gold and rose-coloured rosettes. In the diadems were bits of glass and silver enjoined to make a brilliant halo.

As the centre of polychrome sculpture work Quito did a brisk trade in the eighteenth century. Ecuador sent hundreds of boxes of this miniature polychromic sculpture to Mexico, Peru, Chile, until mass production of the images abroad ruined their lucrative trade.

On the side of the main room off the Father Provincial's suite was an immense chest with two enormous locks. In the centre was a hole of a size to admit the largest of the colonial pesos. I inquired of the padre what purpose this iron chest served.

"That, señor, was for donations from the faithful to ransom Spanish soldiers from the Moors."

"But," I said, mildly astonished, "I thought that took place centuries ago; certainly when Quito was founded the Moors did not have many Spanish prisoners."

At this the padre smiled a knowing smile. "Events move very slowly in Quito. Things that ceased centuries ago in Europe, reach us very late. . . ."

CHAPTER XXII

'AMAZONIC CONTROVERSY'

CHRISTINE and I found it exceedingly pleasant in the afternoon to drop into the cocktail lounge of the Hotel Metropolitano, which reflected, as did nothing else, the cosmopolitan air of Quito and the change that was coming over it. In the well-appointed, comfortable room, women were on equal terms with men and entered alone, or with others, to take tea or a cocktail, an unheard of thing in any of the other mountain cities of Ecuador. Until recently, even in Quito, this would have been considered one of the ranking seven deadly sins.

Looking forward to meeting again some of the charming people I had met before in Quito, Christine and I joined a tall, worldly Dane, named Grut, and his wife at tea, and following the custom prolonged the afternoon with cocktails.

As we chatted, Grut told us of the business he had built up, supplying the foreigners with butter and cream, *a la danesca*, and the difficulties of getting the natives to bring him unwatered, uncontaminated milk. At one time, after months of work, his business almost disappeared when he was stricken with dysentery, malaria, and typhoid, all at one time. A tremendous man, six feet six inches tall, with a frame in proportion, he had been reduced in a few days to a virtual skeleton by these three diseases. It was a laughing matter now and we joined with Mrs. Grut in peals of laughter as she described her poor husband lying in the pest room of one of the city hospitals of Quito (for this is where they put all contagious cases, Indian and white alike); how one of his diseases needed quinine, Blaids pills, and the others,

typhoid serum, and for dysentery injections of emetine and oral administrations of yatren—how one remedy would diminish one of the diseases raging in her husband, while augmenting the others. Thus Grut hovered for weeks between life and death. Now before us he was once again a heavy, beaming man, living testimony of the miracles, if not of the Quito atmosphere, then of Man's medicine, intelligently administered.

More of the 'bars' *habitués* drifted in; some coming to our table. We were introduced to an Ecuadorian, a German, a Frenchman. Conversation, as it invariably does in the 'bar' at the 'Metropolitano,' drifted into tri-linguals.

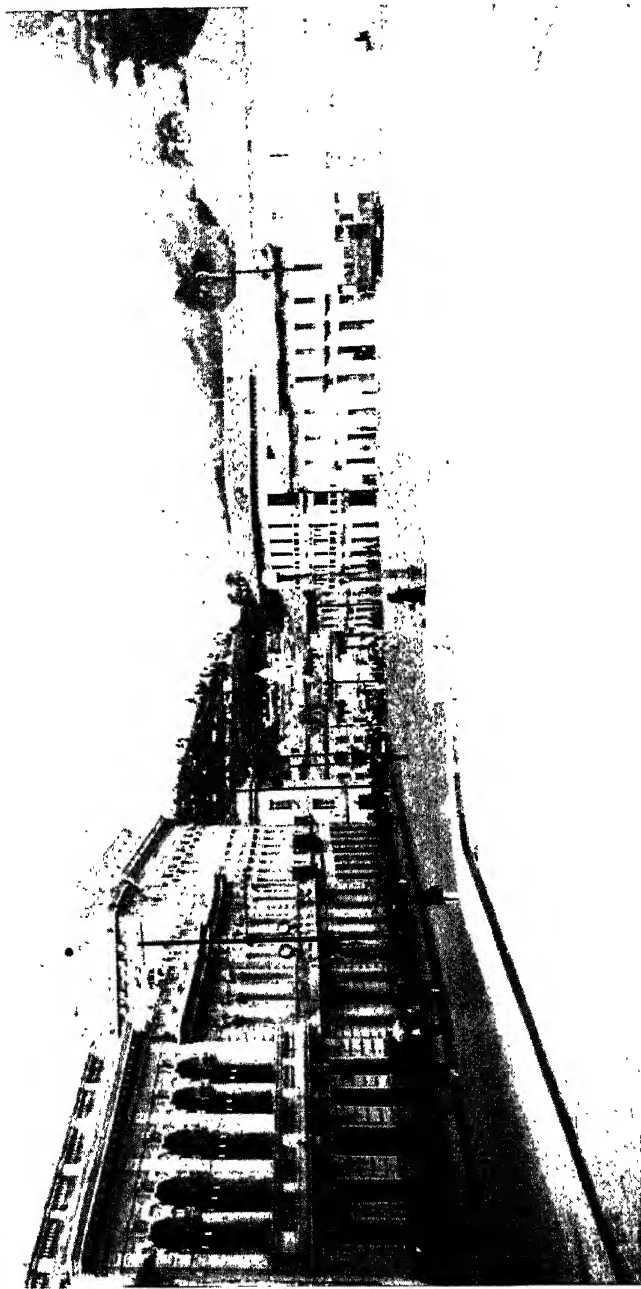
Ecuadorians are very courteous, very personable people. Everything done in Government or business is by personal contact. Many of the courteous phrases are repeated like rote—they are not intended to have content—but merely are a manner of expression. When introduced most casually to an Ecuadorian, he will overwhelm you with his offers of his services. He will insist that you count him as one of your true friends; he will place his house, his *hacienda*, his horses, his life at your disposal; he will protest his ardent desire to serve you in every manner possible, but, in typical oriental fashion, he will parenthetically add that his friendship will not be worth very much—that he is of little utility—he begs, nonetheless, that you apply to him without reserve on any matter.

This bit of social flapdoodle is offered, generally, at the time of introduction or in a confidential tone when departing. I am certain that it is not meant to be taken seriously, for if the occasion arose that you had need of these extensive services, your gentlemen would find equally impressive and equally grandiloquent reasons for refusing. In short, this form of address is merely an extension of our 'How do you do?' which is not a question, but a salutation.

In contrast to this old form of Quiteño manner, there is the attitude of the younger men of Ecuador, who



THE SUN-SPLASHED WALLS OF QUITO'S CHURCHES EXPLAIN
THEIR PLACE IN THE ECUADORIAN'S SOUL



QUITO IS ALSO MODERN, WITH WIDE PAVED STREETS AND MODERN
TRANSPORTATION

have been educated not in Paris, but the United States. The idea of the *caballero*, a gentleman, imposing in dress and manners, who lives without soiling his hands, is disappearing among the younger men and a more virile type is emerging.

Such a one was an Ecuadorian engineer and architect who had returned to live in Quito. Although distressed by some of the provincial things he saw he was animated by a fervent patriotism and desire to push his country forward. At present he was engaged in building, only a few doors from the Hotel Metropolitano, Ecuador's first 'skyscraper,' which meant that the building would be seven stories in height. He had to put up with much banter and good-natured ridicule about this building. He had slipped in behind our large table, exchanging witticisms with several of the people.

A remark by one of them struck home, touching a sensitive point with the engineer.

"Don Eduardo, you waste your time putting up such a large building, when war breaks out between Peru and Ecuador the Peruvians will make for that building just as if it was the Eiffel Tower."

This casual remark brought the whole conversation around to a very ticklish subject: The question of the encroachment of Peru on Ecuador's territory in the Amazon. It was a very irritating fact to the Ecuadorian, and Christine and I, who had been in the Upper Amazon and knew personally of the great extent of land in dispute, were in a position to understand both sides of the question.

"That they may do, M. Courbet," he answered. "But we will fight them. If the utmost pretences of Peru be realized, Ecuador will be left with only the smallest margin of territory on the Pacific and seventy-five miles hinterland. We stand to lose some one hundred thousand square miles by this land-grab of Peru's."

"But you know, Don Eduardo," someone interpolated, "that Ecuador is not strong enough to defeat Peru, what good would it do to fight if you lose, anyway."

"I know we would lose," he answered heatedly, "but it would be one way to sustain our country's solidarity."

"You see," and he addressed those of us who might not know the historical background of the Ecuador-Peru conflict, "our controversy with Peru is only second to that between Paraguay and Bolivia. We have fought over this territory since 1740. Naturally, the Spanish colonial officials began the trouble. The shifting of Ecuador from the Presidency of Quito, from the Viceroyalty of New Granada to Peru, and then vice versa during colonial times, left us with unsettled borders. When Ecuador became a Republic in 1830, we claimed the colonial Ecuadorian territory for our State. We said that by virtue of the Royal grant, we possessed potentially, if not actually, such and such territory. It's an axiom in international law, that when a country successfully revolts from its mother country, its boundaries shall be the territory it held as a colonial possession. It is that territory which we claim. And we have already fought Peru twice over the same question."

At this point I suggested that in my travels over the territory in dispute, I found the natural resources not worth fighting over, irrespective of the academic point of objective rights.

"You say that," Don Eduardo interrupted me, "without considering that the Amazon will soon be the last frontier. It is almost virgin territory. Quinine, rubber, cinnamon bark, vanilla, and cotton grow there. You know its fertility? If we were able to build roads into that region we might tap unknown sources of revenue and natural resources. But what have we got? Two million sucres a year for public works! That is a little less than one hundred and fifty thousand dollars. Imagine such a sum for road building in the entire country! Americans like to speak about our backwardness. In a sense it is true, but we have not the necessary capital to construct these roads. Imagine building roads fit for automobiles to pass over, roads that must cross the Andes at fifteen thousand feet, and

then plunge down the eastern slopes at a drop of one thousand feet an hour!"

"Our friend, the explorer here," and he waved his hand toward me as I sat sipping my whisky and soda, "will tell you that on the eastern side of the Andes there is rainfall of over two hundred inches a year. Two hundred inches! Do you know what happens to roads under such deluges? That is the reason we haven't been able to penetrate the Oriente. Until we have roads, we can't establish our claims to this immense territory which belongs to Ecuador under the points of its original grant. The territory is ours also by virtue of colonial exploration and the Protocol of 1830 by which Peru gave up its claim to all lands north of the Amazon."

The Frenchman at this point offered objections. "You know, señor, that Peru claims that the Cedula of 1830 is a forgery. Ecuador simply alleges that Peru gave up all of the land in the Oriente under dispute. The Peruvians say that under the terms of the Cedula of 1802, and under the grant to Maynas, that all the land that is navigable by larger boats shall belong to, and be controlled by, the Bishop of Maynas. Too, the pertinent adage that possession is nine points of the law means that the law is on the side of the Peruvians. They have, more effectively than Ecuador, colonized the region. Look what they have done to Iquitos, once a mud hole. Señor, I know, for I collected rubber in the old days. Now Iquitos is a modern city with floating docks, a population of twenty thousand, and airplane service to Lima twice weekly. You Ecuadorians claim Iquitos, also, but how . . ."

For the remainder of the afternoon and into the dinner-hour, the controversy went on and still continued after we had gone, for it is a matter of great concern to the Ecuadorians.

We had not been long in Ecuador before we learned of this heated controversy between Peru and Ecuador. The newspapers kept up a constant barrage against Peruvian occupation of their 'Oriente' territory. Troops

were sent in and altercations between outposts were a constant irritation between the disputants. Since 1887 the disputes have been periodically placed before various foreign powers. Ex-King Alfonso XIII of Spain agreed to accept the respective claims for arbitration, but the mass of facts and hypotheses was so enormous that a decision and award was never made. Three decades later there came rumours that his settlement would be detrimental to Ecuador even if not completely satisfying the demands of Peru. Incited by the eloquence of their leaders and the heated articles in their newspapers, Peru and Ecuador prepared for war and faced each other on the border. The United States, with other Latin-American powers, intervened. King Alfonso withdrew as arbitrator. Tension lifted somewhat; the armies dropped back from the border. The neutral powers suggested the Hague Tribunal, and although this was acceptable to Peru, Ecuador objected that it would not, and could not, allow a neutral, uninterested body to arbitrate a question which affected its national sovereignty. And so the matter drifted.

In 1924 Peru and Ecuador signed a protocol to negotiate their various claims by direct arbitration. Meanwhile, Peru made further military penetration into the region under dispute, and while we were in Ecuador this small determined country began to arm for the inevitable test of military strength. Daily new guns came to Quito; the army trained, the ordnance manœuvred. New detachments were sent into the Oriente and the incidents continued. The costly war waging between Paraguay and Bolivia did not serve as an object-lesson. An armistice, however, was reached in 1935 by the disputants, and Ecuador and Peru again agreed to meet and discuss peacefully the settlement of the territorial dispute. Washington decided to play the host to the two countries' representatives, and President Franklin D. Roosevelt agreed to act as referee, provided that the delegates first reached an agreement on their various zones of influence. When that agreement was reached,

then, and then only would the President of the United States study the matter to make final the small outstanding differences.

This matter may seem ludicrous to us, the long fight over an area which possesses no immediate commercial advantages. But why should Europe have a monopoly on territorial disputes? In the Americas we face numerous deep-seated causes of conflict. Ecuador versus Peru is but one example. Others are Mexico and Guatemala; Guatemala and British Honduras; Nicaragua and Honduras; Costa Rica and Panama; Colombia and Peru; Peru and Brazil; and so on, interminably. Many wars have been fought over these boundary questions; politics is an important factor; regimes are upset, the countries unstabilized because of them; commercial relations are hindered. We have little moral reason to look askance at Europe when the affairs of our own American Republics are in such a confused and unsettled state.

The events that followed the departure of the delegates of Peru and Ecuador to Washington, to decide this issue, present a lamentable but true picture of some dominant Latin-American characteristics. The six Ecuadorian delegates went to Washington with their families (and race suicide in Ecuador does not exist). The delegates, as was befitting the sovereign character of their mission, took suites in one of Washington's finest hotels. The cost of maintenance of the delegation ran into thousands of dollars, and when changed into Ecuadorian currency the expenses amounted to half of the sum that is expended annually on all of Ecuador's public works. Ideals may be high, but patriotism can easily be diverted into channels of petty personal gain. For eight months the delegations remained in Washington, each one haggling among themselves. The President of the United States never had an opportunity to make an arbitrational award, and the matter still is unsettled. For all the time they were in Washington, the two delegations of Ecuador and Peru never met face to face.

CHAPTER XXIII

THE CASE OF THE TORTOISES

WITHIN our first weeks in Quito I was brought to the realization that my plans for legislation for the Galápagos Islands would move slowly ; that was inevitable ; for the machinery of government in Quito is meshed only for low-gear.

We moved from the Hotel Metropolitano, after a few delightful weeks basking in the light of civilization, into a house we had rented in the suburbs of Quito near the American Legation. From this place I stormed the bastions of indifference, and my enthusiasm was the only thing that bore me up during those trying first weeks, when, without for a moment losing their traditional courtesy, the heads of the government pointed out with justice that the delicate political situation that had just produced a Dictator was of more concern than the extinction of tortoises.

Finally, legislation for the Galápagos began to germinate, and upon my return in April from a short trip I found that I had enlisted two powerful aids. One was no less than the head of Government, Sr. Don Federico Paéz, then called Jefe Supremo (Supreme Chief). Educated in Brussels, Sr. Paéz had a very broad understanding of the problems that Ecuador faced and was not entirely unsympathetic with my plans for the Galápagos. He, with Señor Don Jonas Guerrero, former Vice-Rector of the University of Quito, began to take an active interest in my suggestions. I was asked to draft the resolution for the Galápagos.

In the meantime, Christine, becoming involved in some of Quito's social affairs, cabled for some clothes

from the States. We had not come to Ecuador prepared for a lengthy stay in their cities, and now Christine was caught with only a few dresses, in a city where the women are always attired in the very latest mode. Since one cannot buy dresses ready-made in Quito, and as it usually is a matter of weeks to have them made, the best way was to send for things from the States.

Now, while it may seem frivolous to mix a woman's clothes with the question of the preservation of the Galápagos tortoises, the matter of getting the clothes out of customs was almost as difficult as writing a complicated legislative bill.

Between Christine's cry for clothes and the cry of the Galápagos tortoises for protection, I spent a number of hectic months in Quito. It was a good thing that I was thoroughly used to climbing, for I did a good bit of it, due to the matter of the clothes. The affair of Christine's dresses will well illustrate how things are done in Ecuador. It began with a simple notice from customs saying that there was a package awaiting my examination.

After ascertaining that the clothes were really hers and intact, the custom's man handed me a bill for three hundred and fifty sucres. Remembering that calm is a part of an Ecuadorian demeanour, I asked quietly: "And what is the three hundred and fifty sucres for?"

"Duty, señor," and he pulled out a long and complicated document. I scanned it with infinite calm: duty on merchandise, two hundred and fifty sucres; national defence, warfare, brokerage, stamps, storage, stamps for social welfare, each adding a bit, until the duty on these clothes, easily replaced for one-third of that price in Quito, reached the impressive total of three hundred and fifty sucres.

I began slowly: "But these clothes are old clothes; it is so stated on the package in Spanish as well as English, and by the state of the garments themselves it can be seen that this is so . . . since we are residents of the country . . ."

The clerk interrupted me. . . . "I am sorry, señor, I

have no authority. If you will be so good as to see the Señor Director of Customs. . . . Right here," he said, "turn to your left on the second floor."

I went up the stairs, announced my difficulties and was ushered into the Assistant-Director of Customs. There I began my tale of woe. . . . My wife was practically without clothes in which to appear in the magnificent society of Quito . . . weeks would go by before clothes could be made . . . these that came from the States were adequate, but the customs' duties were outrageous beyond all reason. . . . I could not . . . and thus I went on.

The Assistant-Director listened patiently.

Finally: "I am so very sorry, señor, we shall see what is to be done, but I can do nothing without a written solicitation . . . now you go on the third floor and there purchase a *papel sellado*—you perhaps have made them out before—the paper is purchasable for fifty cents. All solicitations to the Government must be so made."

I climbed to the third floor, secured my *papel sellado*, put down, in my most grandiloquent Spanish, the sad case of Christine's clothes. I returned and handed it to the clerk.

He read it over carefully. "I am sorry, señor (that phrase always prefaces something unpleasant), I am sorry, señor, but the paper is not made out properly. You do not state your age, your position, your marital state, and it is not made out by an official notary. Now, if you will purchase another piece of *papel sellado*——"

I climbed to the third floor again, bought my paper and proceeded to one side of the main plaza, where there were notaries and *escribientes* by the pack. I singled out one black-clad Cholo *escribano* and he put to paper my tale of woe. It began:

'I, Victor Wolfgang von Hagen, American, white, a citizen of good standing (*sic*), married, age twenty-eight, childless, profession naturalist, a visitor to the Republic of Ecuador' . . . and so on for a very lengthy

preamble, to the simple facts of the case—that the clothes that I wished were used clothes, the customs' duties were in no wise consonant with their value, and I begged that the Director of Customs reconsider . . . Wearily I dragged myself up once again to the second floor. The clerk scanned the solicitation, passed into the Director's office, emerged, and said :

"I am sorry, señor . . . the Director is busy ; if you will come back to-morrow . . ."

I reappeared on the morrow ; the clerk was sorry but the Director was ill. To-morrow—again to-morrow. The clerk was again sorry, but the Señor Director had to be absent to go to the funeral of a relative. At last, on the fourth *mañana*, I cornered the Director.

"Now, *caballero*, about your solicitation," he began, turning to face me. "I have read it thoroughly and can sympathize with your position. I am sorry" (there it was again), "señor, but there is unfortunately nothing that I can do for you. It is a matter of the Congress."

"Congress !" I echoed.

"Ah, yes," he corrected himself. "I have forgotten that there is no Congress, and since it has been dissolved, it is a matter for the Head of the Government. We cannot transcend the rules. All these items, which you consider excessive, placed on your statement for the used clothes of your wife, Doña Cristina, are done under our Constitution and the rules of customs. I can rescind nothing. Now, I suggest that you go up to the third floor and get another piece of *papel sellado*, search out a notary and make a petition to the President of Ecuador to permit these used clothes of your wife's, the Doña Cristina, to enter without duty. Since you are our guests and have given the Republic two fine statues of Darwin, I am sure the President cannot refuse you."

A few days later I received a call from the President's office that he was now free to consider my proposals

for the Galápagos Islands, and with Sr. Don Jonas Guerrero went to his office. In one hand I bore the legislation for the Galápagos Islands, in the other the petition for clothes (to protect the fair skin of my lady) now lying in the customs office. I hardly knew how to begin to bring a matter of a bundle of used clothes to a busy executive immersed in the affairs of State. I began badly, and Sr. Paéz saved me from embarrassment by asking for the solicitation and signing the paper without even reading it. He called in his assistant and told him to see that the package was sent to my home. Then we sat down to consider the Galápagos Islands.

The Republic of Ecuador jealously guards the possession of her islands and resents the slightest intrusion there to undermine her sovereignty, as is understandable and can be sympathized with. She has no navy and must depend solely on her policy not to allow foreigners there who have any power. As a prelude to a sensible programme of conservation, the first thing was necessarily some legislation that would permit intervention by accredited foreign scientific groups, for Ecuador is too poor to maintain or initiate such a programme of conservation.

I had first drafted the general parts of the proposed legislation, then Señor Guerrero had my programme adapted to fit the general frame of a constitutional decree. This had taken months; now we were to have a decision as to whether this draft was adequate.

I had written to many institutions in the United States whom I thought would be, or should be, interested in protection for the Galápagos species. Since I was a tyro at such legislation, I had need for suggestions. One answer from the secretary of the International Wild Life Committee was typical: 'Our committee has no interest at present.' . . . No interest! They had taken part in campaigns to save an obscure genus of animal from extermination, but they had 'No interest at present' to help save the fauna of the most

fascinating theatre of living evolution in the world. We proceeded without them and did the best we could.

The legislation was finally drafted and signed by President Paéz on 14 May 1936, a decree 'declaring National Reserve Parks of the fauna of the Galápagos Islands—Decree Number 31.' In substance the decree stated: 'As the fauna of the archipelago was nearing the danger line of extinction—an irreparable loss to science—whereas in the Galápagos Islands certain conditions exist that make the area unique in the world—the Government decrees that the islands of Hood, James, Duncan, Barrington, Jervis, Seymour, Tower, Bindlow, Abingdon, Wenman, Culpepper, Indefatigable, and the part of Albemarle, north of the Perry Isthmus, are to be National Parks—no hunting or capture of animals would be permitted without a permit from the Board of Directors.' . . . Since Chatham and part of Albemarle represented the investment of powerful interests, I thought it best that these sections be excluded from the reserve islands, thus avoiding a source of friction.

This decree authorized the government to make arrangements for scientific institutions to take under their auspices the establishment of Research Stations on the archipelago. Tourists, or yachtsmen, cannot capture nor carry away any of the species. When an institution wishes to collect on the Galápagos, it is to be referred to the Research Station on the Galápagos, which, having in its files records of the state of the fauna, will be able to state what can be taken without endangering the existence of the fauna. With these provisions made into law, I thought my work done.

Then I learned that a decree is one thing; for it to become legal is something else. Before it is legalized it must appear in the *Official Gazette*. I visited the Official Printer and told him I would like to see the decree printed before I left Quito.

"Señor," he purred, "allow me to show you something. Do you see those decrees piled up to the ceiling?"

There are hundreds of them there. . . . I cannot print this, your particular decree, out of turn. It would not be right. Legal? It would not affect its legality to take things out of turn, only I am not quite able to do it. Naturally I am deeply sympathetic with your work, for I have followed your efforts to save our *riquezas* in the archipelago. But you can consider the matter yourself. If I did this for you, some people might think that I, personally, am getting something from it . . . and," he shrugged his shoulders and looked quite dejected, "what is the use of them thinking so, if it is not true?"

Two weeks later, Decree Number 31, making the Galápagos into an Animal Sanctuary and allowing the intervention of foreign scientific institutions to assist in the matter, was printed in the *Gazette* and made legal. The first part of the campaign was finished.

Still, not an institution in the United States had made a comment; there had been mild protests against the fauna's rapidly approaching extinction, yet no effort had been made to do anything about the Galápagos situation. When I returned to the States, after two and a half years' absence, there was a response from England. Dr. Julian Huxley, grandson of the famed T. H. Huxley, and secretary of the Zoological Society of London, asked me if I would come to England to address the members of the Society and meet the Galápagos Committee of the British Association of Science to propound my plans for the Galápagos sanctuary.

Dr. Huxley assembled the members of the committee and we began work. Finally, we evolved a plan. Mr. Rader's property on the Indefatigable was to be purchased and a warden placed on the islands to guard the fauna. Signs were to be posted at all the landings, asking visiting yachtsmen and expeditions to see the warden first for details on the fauna. The dogs, cats, and rats were to be eliminated by systematic hunting, to allow the fauna a chance to re-establish itself. On those species nearing extinction, complete embargo was

to be placed. A resolution was passed that funds be raised and the interest on them used for the project. The second part of the plan was done.

Still no word from American institutions. They were not interested. Unfortunately, English action is still in the state of resolution. Nothing has yet been done, and every month complete extinction of the fauna on the Galápagos comes nearer.

The only way to save the Galápagos species is by a collective effort on the part of Ecuador, England, and the United States. There must be a joint guardianship of a heritage that Nature has preserved intact for millions upon millions of years, and that man has brought close to extinction in only three hundred years. It is a unique legacy; it may provide some means of finding out what we are and why. It is up to all of us to devise some way to protect the Galápagos Treasure.

CHAPTER XXIV

QUITO OF THE INCAS AND THE COLONIALS

QUITO was already a great metropolis when the Incas conquered it in 1467 and made it a part of the expanding Incan Empire. Its modern history began with its conquest by the Spanish *conquistadores*, who after the death of the last Inca, Atahualpa, began the systematic sack of the Incan cities.

Sebastián de Benalcazar, one of those conquerors, had heard from the Indians of the wealth of Quito, but he had little idea of the distance involved from Peru to the Ecuadorian highlands. Without consulting with his chieftain, Pizarro, he left for its conquest accompanied by one hundred and forty soldiers, both horse and foot, together with innumerable Indian auxiliaries drawn from the best of the Incaic legions.

Historians point out the difficulties of that journey across the high, wind-swept *paramos*, the swollen rivers, and the heights that had to be scaled. Yet I, who have taken the same journey, would venture to point out that their expedition could not have found the road worse than it is now, for the Incas had a better system of communication from Peru to Quito than the Republic of Ecuador maintains to-day. We know that stone roads existed, that suspension bridges spanned the seemingly bottomless *quebradas*, and that is more than I can say for the same regions now. Withal, the conquest was not easy; organized resistance such as they had not met with in Peru kept the Spaniards ever on the alert. The famed Quito general, Ruminahui, met the Spaniards along the way and gave battle after battle. At Riobamba the Indians met with a devastating slaughter and were

forced to retreat upon their capital, Quito, one hundred miles north of Riobamba. Sebastián de Benalcazar moved relentlessly up that great inter-Andean valley through the long lines of snow-covered volcanoes which crowned these Cordilleras. To add to the consternation of the invading Spaniards, Cotopaxi, the highest volcano in the world, was in a major eruption.

Meanwhile, in far away Guatemala, Pedro de Alvarado, erstwhile companion in arms to Cortés during the conquest of the Aztecs, dreamed of the riches of the Indians to the south. He had recently been to the Court of Spain, and the sight of the Incas' gold which he had seen in the Royal counting-houses there, whetted again his appetite for conquest. From rumours and the returning soldiers from Peru, he, too, had heard of the riches of Quito, and understanding that Pizarro had so far confined himself to Peru proper, he decided to undertake the conquest of Quito himself.

Alvarado outfitted himself with an expedition, the best to appear in the South Pacific. A number of ships carried the band of five hundred men and horses that appeared off the coast of Ecuador in March 1534.

Encountering very little opposition from the natives of the region, the vessels moved into a harbour of the Bay of Caraquez. There Alvarado obtained guides from the Indians in this region, and the expedition moved quickly on through the arid regions of the Pacific littoral to follow the Rio Chone into the interior and the swamps of the tributaries of the upper Rio Guayas. It is not to be supposed that the scant Indian population of the jungles barred the way to Alvarado and his band. There was, indeed, no need.

The jungles were doing their work. The Indian guides deserted; food became extremely scarce; the horses, trying to manœuvre in the morass of the rivers and thick jungles, unseated their riders, and these, weighed down with coats of mail and heavy arms, were bogged down by their own weight. The distance from Alvarado's disembarkation point to his goal is

one hundred and fifty miles in a straight line, but the circuitous route that the nature of the terrain forced upon him must have doubled this distance.

Above the verdure of the forest was a perpetual signpost: the snow-capped head of Chimborazo. The climbing of the Andes must have been no small feat for Alvarado's soldiers. Their coats of mail must have been no less burdensome here than in the jungle. Eventually, they emerged on top of the Cordilleras, where they met a new onslaught, the bitter cold of the Andean *paramos*.

At this time a good part of the Indian auxiliaries perished, and already a fourth of Alvarado's men were left for the condors. At last they came to the travelled regions of the plains of Riobamba, and here Alvarado's scout brought back crushing intelligence. He had found the footprints of many horses and evidence of a recent battle. Thus Alvarado learned that he had been forestalled in the conquest of the Quitus.

Emissaries of the *conquistadores* who had preceded Alvarado appeared on the horizon a few days later. His movements along the coast of Ecuador were known and he had been expected. Pizarro, in the midst of his campaign in the south, learning of the unauthorized departure of Sebastián de Benalcázar for the conquest of Quito, had sent his companion-in-arms, Diego de Almagro, to overtake Benalcázar to curb that unruly spirit. It was Almagro who learned of the arrival of Alvarado in Bahía de Caraquez. As he did not know at what point the latter would emerge on the great Andean plateau, he had stationed groups of men at the most likely places. Confronted with an armed force, and with his men already wavering in their loyalty because of the physical hardships they had endured, Alvarado agreed to a truce. After prolonged haggling he sold his ships, arms, and equipment to Almagro for 100,000 pesos d'oro (about half a million dollars). This new equipment meant much to Almagro; for ordnance and horse he had a pressing need.



THE HUIUSIPONGO OF THE HIGHLAND INDIAN



AN OTAVOLO WOMAN WITH ABSURD MUSHROOM HAT
ATTENDS THE WEEKLY FAIR

Meanwhile, Sebastián de Benalcazar, pressing his advantage over Ruminahui, laid siege to Quito. Its defenders, unable to withstand the shock of the white man's horses and booming ordnance, capitulated, but not until Ruminahui had pillaged the entire city and carried off everything of value. The treasures of Quito had disappeared.

Into the smouldering ruins of Quito, like Napoleon into Moscow, came the Spanish conquerors to search in vain for the fabled treasures of Atahualpa. Save for some items of little value, no vast amounts of gold, such as were found in Peru, could be located. Had the Indians carried off the treasures and buried them? Captured Indians were put into a provisional rack, tortured, and broken to reveal the hiding-places. To save themselves, Indians confessed to small caches that they themselves had taken. These were found, but no one could, or would, reveal the great hoard which the Spaniards thought must exist. For the next years it was the one topic, the sole question of the conquerors. Where was the treasure of Atahualpa?

Administrative necessity soon demanded the establishment of a city. From the ruins of the ancient Andean city a new one arose. The conquerors obtained building materials, finely-chiselled stone pieces, from the fortresses and palaces the Incas had built. Starvation brought back some of the Indian populace, so that labour was not one of the pressing problems. On 28 August 1534, the city was named Villa San Francisco de Quito, after Francisco Pizarro, the senior *conquistador* of Peru.

Meanwhile, Sebastián de Benalcazar, who had 'reduced' the Indians of Quito, had moved on to Colombia to the north. Rumours were heard of a king of the Chibchas, whose custom it was to be smeared with balsam and then have gold dust blown all over his body. Here were the illusory riches of an empire, and Benalcazar set off after them.

Almagro, still fretting over the treasure he had lost by the sack of Quito, this time did not follow Benal-

cazar, but remained to administer the new conquest. The soldiers were now able to indulge themselves freely in their long suppressed passions. Each had his concubine, or if he were particularly fortunate, he had several. Most of the women were high caste Quito Indians, either noble women or of a high type of vestal virgin. White women did not come to Quito until 1546. By that time the problem of half-castes had begun to plague the colonial administration. But what could be expected from the soldiery? They came for conquest, and the booty they found was soon lost in gaming. The fabled treasures were too few, and those whose hand touched gold gambled it away in a night. The Spaniards were unable to understand that the gold and silver that they saw represented hundreds of years of collecting by the Indians and had belonged only to the nobles—to the religious caste, and was thus concentrated in the hands of a few. Deprived of the fruits of conquest, the Spaniard was not willing to turn his sword into a plough-share.

Gonzalo Pizarro, brother of Francisco, became the governor of the Villa San Francisco de Quito in 1540. With his rule, the comparative calm of the last few years ended. He had heard of a region to the east of the Andes, a part of the country which the Indians had indicated was rich in spices. Canelos—the land of cinnamon—it was called. To prove the name was not wholly a rumour, the Indians brought the bark of cinnamon trees to the Spaniards. New fortunes could now be made, for spices were the original impetus for Columbus' voyage. If rich new spice regions could be found, the Spanish could break the monopoly held by their hated rival, Portugal, who controlled the importation and sale of spice in Europe. The cinnamon of the Americas is a different species from that found in Ceylon, where the cinnamon of commerce is found. Pizarro (who was no botanist) thought by the samples given him that it would be plentiful.

On a memorable day, Gonzalo Pizarro assembled

three hundred and fifty men, half of them mounted, and four thousand Indians, with pigs and llamas for food. With the Indians driving the animals before them, the expedition left for the south-west from Quito, to the part known as Papallacta. Not only cinnamon was in the air, but the legend of El Dorado. Sebastián de Benalcazar had not found the Lake of Treasure, where the gold-covered Chibcha king was supposed to bathe, but it might be anywhere, and the Indians, always anxious to whet the avarice for gold, gave minute directions where it might be found. Papallacta lies on the *paramos*, forty-five miles beyond Quito, a good two days' march from that capital; from there on the mountainous Indian roads seemingly ended, for the Inca had had only partial sovereignty over the jungle folk of the Upper Amazon. Some miles from this region the trail now leads, as it perhaps did then (for Indians of the mountains traded with those of the jungles), to the east of the Cordilleras. Here the Spaniards found intense cold, made doubly annoying by the armour next to their bodies.

From this point onward the small army faced multiple hardships. There were no footholds for their horses. The volcano, Sangay, raising its snow-capped head from the sea of the eternal green of the Amazon, gave vent to rumblings that were little less disturbing to the mountain Indians than the feared denizens of the jungle. Hundreds of the Indians deserted, horses were lost by falling through the great *quebradas*, rain came down in torrents, and the live stock, driven before them, was stolen by the Indians of the jungle, hanging on the flanks of the main body of the expedition.

At present it takes seven days to go with little impedimenta from Quito to Papallacta, thence to Baeza-Archidona and the Napo River. It must have taken Pizarro some weeks; although the chroniclers give no definite dates for the first part of the trek, they do insist that the party arrived exhausted on the banks of the Napo River, with many of the party dead and the

survivors in a miserable condition. Pizarro did find the *canelo* or cinnamon. The bark was there, but by no means in the quantities he had expected.

There were no groves of cinnamon trees, and it would take weeks and months to make a respectable shipment of such spices as could be harvested. The men were in a hurry for riches. Always before them was the Lake of Gold. So Pizarro moved on to the Napo River, believing that he would find somewhere near the fabled lake.

The Rio Napo at this point is wide and deep, and Pizarro reasoned that a vessel of some tonnage might be built to carry them down to the confluence of the Rivers Coco and Napo. With this in mind the expedition began the construction of a brigantine, the first, and perhaps the only one, ever constructed in the Upper Amazon.

Having a goodly supply of axes, saws, and hammers, they were, however, short of nails for the vessel's construction, so they used the shoes of their dead horses for this purpose. Bellows were made out of their buskins for melting the iron. I think six months, at least, must be allowed for the construction of this vessel.

It could not have been large, perhaps seventy-five to a hundred feet in length, and drew not over six feet of water. Caulking was done with the tattered shirts of the men of the expedition and from squares of bark cloth obtained from the Indians. During the building, the expedition lost more Indians from desertion and men from attack, and the once immense amount of live stock dwindled. When the vessel was ready to sail Francisco de Orellana, Pizarro's chief lieutenant, was placed in charge of the crew of able-bodied men with a small complement of Indians, and those who were unable to travel by land were placed aboard.

Orellana's instructions were to move slowly until he came to the confluence of the River Napo with the River Coco. They were to avail themselves of the food that was supposed to be there and come back up stream where Pizarro and his group would await him. The

junction of these rivers is approximately fifty miles from the place where the vessel was built. Caught in the swift current of the Napo the vessel was borne quickly to the Rio Coco. When Orellana arrived at the junction of the rivers, he found only a few houses. Little food was to be had there. The native Indians, frightened by the appearance of the brigantine, took to the jungles.

There was nothing else for it. Since he and his men, weakened by lack of food, could not hope to take the vessel up stream against a raging six-knot current, Francisco de Orellana decided to follow the great stream of water to discover where it led. Orellana has been called a traitor for making this decision. True, he deserted Pizarro, who was left alone with the remaining expedition up the Rio Napo without provisions, but with high hopes of the return of Orellana with food and intelligence of the regions about the Coco. If Orellana did not choose the path of honour, the path he did take was not that of least resistance.

Those aboard who demurred at this treason were dumped unceremoniously on the shore, and the brigantine set sail down the length of the Amazon. Few expeditions can compare with it. With scarcely any food, moving through a hostile country, attacked by Indians, buffeted by the elements and the insufferable insects, the expedition moved down the entire length of the Amazon.

When more than half of the journey was completed, they were attacked near the Rio Trombetas by a group of Indians led by women. Tall, robust, fair, with long twisted hair about their heads, these women who set upon him with such fury were called *las amazonas* by Orellana. And although he did not give the region that name, his report that he had been attacked by women fired someone's imagination to place this appellation on the whole basin.

Orellana's remarkable exploit ended with a successful voyage to Spain, where he made known his discovery ;

his reward was a new expedition. Returning with a number of vessels, he ran into misfortune ; he lost some of his ships in an attempted ascent of the river he had discovered, and had to abandon the second expedition, a retribution, perhaps, for his perfidy to Pizarro.

The latter, meanwhile, was waiting on the banks of the Napo River. Weeks went by, and months went by, and there was no news of Orellana. At first they assumed that Orellana, the vessel, and the expedition had perished, but this assumption was soon dissipated when they came across a white man wandering naked in the jungle.

Half-crazed from fear and lack of food, the Spaniard, when partially restored to reason, told his story. He was Sánchez de Vargas. He was among those set ashore by Orellana and had since wandered in the jungles, living on what he could find. To the horror-stricken group he related the explicit details of Orellana's treachery. The truly heroic character of the Spanish *conquistadores* becomes evident in their next decision. They were numbed by months of exposure, lack of food, deserted by most of their Indians, many of them ill and without shoes, but they decided to return to Quito. In June, 1542, the people of Quito, who had given up the whole party for lost, were startled to learn that a ragged contingent of Pizarro's men had appeared on the eastern Cordilleras. Most of them were naked, their weapons were rusted, their faces heavy with long, matted beards. They were utterly unrecognizable as the gay, adventurous group that had set out for the Land of Cinnamon at Christmas-time, 1540. Clothes were dispatched to them, and the little band staggered into the city of Quito. Of the three hundred and fifty men who made the expedition, only one hundred returned. Of the four thousand Indians, there were only a handful. Thus ended the first attempt to explore the vast regions of the Amazons.

For fifty years Ecuador had been a theatre of carnage : Quito, first razed by the Incas in 1487, had been rebuilt by them in their characteristic style. In 1533 it was sacked by the Spaniards and burnt by the Indians. Despite destruction, civil war, and lack of official recognition at the court of Spain, the colony, none the less, grew. The Indians loved their bit of earth ; driven from it, they would return again and again, even though it was to virtual slavery among their conquerors. So Quito, nestling on the flanks of the volcano of Pichincha, was born again and again—evolving from the conquest, the rack, the scourge of the Inquisition and the battles between the victors for the possession of a continent. Gonzalo Pizarro soon passed from the scene, beheaded by a new Viceroy, and Quito entered, with Peru, into its colonial phase.

Gradually order came out of the chaos of conquest and the Viceroys now in saddle brought about a systematic exploitation of the Incas' inheritance. New arrivals swelled the cities. In 1560 the residents of Quito requested the King that the region of Quito be constituted a Royal Audencia. With that decree, its boundaries were to run :

‘ . . . along the coast in the direction of the City of Kings (Lima) as far as part of Paita . . . and inland, including the towns of Loja, Jaen Valladolid, Loja Zamora, Cuenca, La Zarza, and Guayaquil [thence to the Upper Amazon] in the direction of the towns Canelos and Quijos . . . the boundaries would include Pasto and Popayan [now Colombia].’

Neither its isolation nor the activities of the English pirates in the Pacific now could hinder the growth of Quito. Those who came to the New World became instantly attached to the regions of Quito, the eternal spring of its climate, the hosts of obedient Indians to do one's bidding, the easy life of a colonial squire. Save for trips to the coast, life in the Villa de Quito became adjusted to the eternal similarity of day to day living.

During the colonial period the gentry gave up, almost

entirely, exploring the country beyond Quito. Curiosity concerning the natives of the Amazon was confined to the monks and padres who made long and toilsome journeys into the little-known 'Oriente.'

To the amazement of the inhabitants of the city, there appeared one day in Quito a group of Portuguese headed by a Captain Pedro Texeira. He had, with a party of Portuguese and Indians, ascended from Para to Quito, a distance of thirty-five hundred miles by water. It was the first time that the ascension had been made, and the exploit upset the city fathers, for it made their city vulnerable, or at least, so they thought, from attack by their enemies, the Portuguese, who controlled the whole of the Amazons.

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In the middle of the eighteenth century the city was host to a group of French astronomers and mathematicians. As the result of a protracted argument at the French Academy, the King of France asked, and received, from Spain, permission for a party of his nationals to go to Quito to determine the curvature of the surface of the earth and describe its figure and dimensions. This was the first expedition to the New World in the interest of pure science. Messieurs Boulanger, Godin, and La Condamine worked for six years making an extensive and accurate survey of the Cordilleras of Ecuador. Although beset by difficulties and hardships, owing to the severity of the weather and the high altitudes to which they were not at first acclimated, they did succeed in determining the curvature of the earth by astronomical and trigonometrical observations by means of a network of triangles extending to both sides of the Equator. In addition, the plateau about Quito was the scene of the first experiments proving Isaac Newton's theory (previously expressed in succinct mathematical parlance) that the earth had the form of an oblate spheroid.

The difficulties of the expedition of the French

Academicians were not only climatic; they met also the hostility of the sheltered, bigoted people of Quito. The visitors were French, and French pirates had cruised, not many years ago, in the Pacific, raiding, burning, and abducting Spanish colonists; prejudice mounted high. The physician of the party was set upon in Cuenca by an infuriated mob during a bull fight, and killed. The botanist of the expedition, Joseph de Jussieu, made a special study of the Chinchona bark, the source of quinine; his extensive collection of plants was lost, due to the negligence of a servant, a misfortune which resulted in the loss of the reason of the botanist.

In allowing the French Academicians to visit Ecuador, the Court of Spain and the Council of the Indies had departed from its traditional policy of systematically preventing other Europeans to enter the colonies of Spain. They were fearful lest the geographical knowledge so gleaned might be used in an effort to wrest the immense and valuable regions from the grasp of their legitimate owners. The French Academicians had set a precedent and a like courtesy was granted to Baron Alexander von Humboldt some years later, when he, accompanied by the French botanist, Aimé Bonpland, arrived at Quito in 1802.

Humboldt had already spent some years in Mexico, Venezuela, and Colombia, and was amazingly well prepared to study the phenomena of the regions of Quito. He paid special attention to the cartography, botany, and geology of Ecuador, and climbed some of its famed volcanoes. Pichincha, Cotopaxi, and Antisana were studied, and he verified numerous instrumental observations on the climate and temperature of the heights. In June, the clearest month in the highlands of Ecuador, Humboldt attempted the first ascent of Chimborazo. He failed, owing to the desertion of his Indians in the last stages of the climb. Yet nothing in all his travels impressed Humboldt more than this great peak. When approaching eighty-eight years of age, he consented to have his portrait painted. For a fitting

background he chose to be placed before the tall snow-covered dome of Chimborazo, to him the symbol and epitomization of the greatest of his efforts.

During Humboldt's visit the colonial era was drawing to a close. He observed the ill-effects of the Spanish colonial policy and much that needed redress. In Paris, where he met Simón Bolívar, Humboldt spoke of Latin America with great warmth and of its immediate need for emancipation from Spain. This was soon to be accomplished.

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A decade of sanguinary civil strife brought the conflict into Ecuador, and Marshal Antonio José de Sucre, the greatest of Bolívar's officers, arrived in Guayaquil in 1821 to prosecute the revolt against the loyal forces within Quito, which led to the independence of Ecuador.

After the first delirium of freedom was over and the exuberance of the population gave way to sober judgment, the leaders of the revolution realized that they must now become administrators in fact, not in theory. Bolívar had envisioned a great Republic, patterned after the United States: La Gran Colombia, consisting of Venezuela, Colombia, and Ecuador, was created but had neither a long nor fruitful life. In 1826 armed revolts broke out, and in 1830 Ecuador broke away from the Gran Colombia and became an independent Republic.

The lack of men trained for government was immediately apparent in the new State of Ecuador. While Europe had been passing through the stormy times of Louis XVI; while the philosophical writings of the French Encyclopædists, of Taine and of Voltaire flooded Europe; while the industrial age was steadily gaining ground and new social measures were being placed in operation in communities already impatient of the old habits of thought; while the ideas of the French Revolution inflamed all Europe, the people of the Villa de San Francisco de Quito, walled in by the lofty Cordilleras,

and ruled by ignorance and bigotry, 'knew as little of men and events as they knew of events on the Moon.'

But these were not the only factors that kept Quito in a perpetual state of undevelopment. Quito lay in the very heart of a terrain that was continually racked with earthquakes. All about the city the volcanoes of Cotopaxi, Imbabura, and Pichincha periodically gave vent to outpourings of terrestrial resentment and knocked down all that the inhabitants of Quito had built with such painstaking effort. Old Pichincha, Rucu-Pichincha, the Indians called it, would periodically open its volcanic vents and pour ashes and molten rock on Quito, toppling over the towers of their churches, levelling the adobe huts of the Indians. Nestling thus in the very lap of Vulcan, the *Quiteños* believed that their only protection came by throwing themselves still farther into the arms of religion. Rucu-Pichincha has not stirred itself for some years now. Although the smallest of Ecuador's volcanoes, it lies nearest Quito, being only two miles from the heart of the city. Since the volcano had caused so much trouble in the past, I resolved that I would scale its sides before leaving Quito.

CHAPTER XXV

ASCENT OF PICHINCHA

ON a clear June morning I ascended the volcano. Pichincha has two peaks, Rucu-Pichincha and Guagua-Pichincha, meaning respectively, Mother and Child Pichincha. To the Ecuadorian, it has special significance, for on the slopes of Pichincha, at 14,000 feet altitude, General José de Sucre defeated the Spanish forces in 1822 to create the Republic of Ecuador. It can be easily reached by horseback from the rear, but, in consequence of a wager in the Metropolitano Bar between an Ecuadorian poet and an engineer, I agreed to go on foot with them to the top of Pichincha. There was more in prospect than the climb, for the poet, a pallid youth with burning black eyes in his head, promised me that from the top 'Quito would look like a string of pearls across the soft green throat of the valley.' His countryman, the engineer, who had lived in the United States for some time, scoffed at the idea of the delicate poet being able to climb the side of Pichincha. Challenged, the poet responded that he could easily beat us to the top.

We rode our horses to its base, dismounted among the eucalyptus groves, left our animals with a poncho-clad servant, and, taking another to carry our food, proceeded. Although I was the most vigorously built of the three, I found that acclimatization counts for more at these altitudes than a sturdy constitution, and my friends were forced to wait for me more often than I waited for them. The slopes of Pichincha rise abruptly from the valley of Anaquito and after the 11,000-foot level I was forced to stop every ten minutes. With a few minutes' rest, however, I felt as if I might run to the top.

We had begun our climb early in the morning. Mists still veiled the valley and the mountains were obscured. The slope of Pichincha is covered with dwarf trees, laden with pale green moss. On the parts facing the east there is only the tough ichu grass, which grows as high as my waist. This grass was excellent for seizing and pulling myself onward; and when I was going upward at an angle of sixty degrees it was sometimes a necessity.

The zones of vegetation are marked and definite; as if by mathematical calculation: types of flowers and plants, and birds as well, are distributed according to the altitude. Such regularity in nature aroused Humboldt's rhapsodic admiration and astonishment. Boussingault, a French physicist, remarked that here, in the Ecuadorian Andes, one might use the barometer as one used a clock, and a thermometer might serve instead of a barometer in the determination of altitude. As one proceeds from the Equator to the Poles, the mean temperature drops one degree with each degree of latitude. But when one ascends a mountain there is a drop of one degree of temperature with each ascending three hundred feet. As we were climbing Pichincha we were going up a thousand times faster, climatically, than if we proceeded 300,000 feet toward the Pole.

My Ecuadorian friends preceded me and were now standing above me, their heads just appearing over the ichu grass. My heart was pounding like a trip-hammer, but even above that pounding I heard the poet ecstatically shouting to me. The mists had risen from the valley of Anaquito. The snow-covered volcanoes for which Ecuador is justly famed were coming into view.

In a long line on either side of the Cordilleras stretched the procession of 'Volcano Avenue.' Cotopaxi of the gentle sloping line and perfect cone rose from the rugged Andes to a height of 19,600 feet above the level of the sea. As the snow-line begins after 15,000 feet, the great snow cap caught the rays of morning sun, and the venerable Cotopaxi took on the roseate hues of Hiroshigi's prints of Mount Fujiyama. Then in turn

came Antisana, Illinisa, saw-toothed Caraguarizo, once thought to have been taller than Chimborazo, Altar, Tunguragua, a council of great patriarchs, all snow-covered, offering the finest natural spectacle in the western hemisphere. The ascent of Pichincha was worth the effort; grandeur like this that spread out before me is seldom seen, even in years of travel.

We now took our course along the edge of a deep *quebrada* that drove a wedge into the slope of Pichincha, the crest of a vent hole of the disturbed earth. I walked gingerly, not knowing the strength of the volcano deposits. Even along the volcano's abyss there were houses, small adobe *huasipongos*, the roofs thatched with ichu grass, as much a part of the landscape as the earth itself. The houses huddled fearfully along the crevice, and behind them their owners had planted their potato patches on the very edge of the perpendicular drop. Everywhere in these mountains on the Equator are the same contrasts of height and depth, peace and tumult. Here was an Indian home nestling in the crater of Pichincha and not far above it was the snow-line. Here man was living in a comfortless house, eking out, by a terrific combat with the forces of nature, a scant living from his own good earth.

On the slope of Pichincha the government maintains a weather station where the wind velocity and the temperature are recorded by automatic devices. When we made our way to the house to ask for a drink, we found the keeper of the instruments copying with pen and ink the wavering lines that the instrument ordinarily made automatically. The engineer asked him what he was doing.

"I am copying the temperature, señor, I had to be away for the last three days and the ink went dry."

"And," finished the engineer for him, "the device has not recorded the temperature and you are putting it in yourself with a pen. How do you know what the temperature is?"

"Ah, señor, have I not taken these things for years?"

It never varies, if that is not enough ; but, besides, the Professor never knows the difference."

"There you have it," the engineer said with some disgust later, "we give apparatus to these Cholos and what do they know about it? Here we are supposed to have scientific accuracy and this imbecile is copying the thing in by hand, guessing what the temperature is. It is enough to make me vomit. How poorly equipped we are to run a nation. What do we know about machines? I try to impress upon my employees that a machine is not a miracle, but I see them tie apertures of motors with shoe-strings ; loose wires dangle from everything that is mechanical.

"Have you," and he addressed me, "have you ever, señor, been in one of our new automobiles or the taxis you see in the Plaza? You have? Have you noticed the first thing that the driver does? He takes the wires from the horn and then can't get them back again, so in a brand-new car the wire for the horn dangles in mid-air. When he wants to sound his claxon, he touches it on a piece of metal within the car. Progress, Liberty. It makes one despair of progress within our poor country."

The poet took umbrage at the remarks of his countryman.

"How can you say that, with our poets, Juan Montalvo, Juan León Mera, Luis Martínez, our men of science, our republican laws? Have you ever thought of Ecuador's contributions to the world? The potato, quinine, our great epoch of colonial painting, our indigenous fruits that have gone everywhere? Rubber, which first came from Esmeraldas?"

"And just where do we as a nation come in?" interjected the engineer. "What did we have to do with the potatoes or rubber, that existed long before we came to life as a nation? Since we have had a political life, we have been at each other's throats. These political catchwords of Liberty, Equality, borrowed from the French, high-sounding, but, how we have used them! We have had twelve Presidents in the last nine years.

Our Constitution is a perfect model of social progress. But what happens to it? We change it every year. Old Garcia Moreno, when he was President, expressed himself as a true Ecuadorian and patriot when he said that if he could not save the country according to the Constitution, he would govern it according to his own views of public necessity. Every real leader has been assassinated. Our liberator, José de Sucre, General Flores, our first President. Garcia Moreno, who brought back the Jesuits. Alfaro, who built the Quito-Guayaquil railroad. All murdered. We have borrowed our political system from the Colossus of the North, the North American; system of Executive, Legislative and Judicial. We divide our country into fifteen provinces and the President appoints the governors. We have suffrage with representatives, each elected to represent thirty thousand of the population, and senators, two for each province. And where are we? Why, between the years 1830-1909, the Constitution, written by the patriots in the blood of their fallen comrades at the Battle of Pichincha, was changed eleven times. Don't talk to me of progress."

We were now in the midst of a good Latin-American squabble. We three sat on the edge of Pichincha; the city of Quito spread out before us in the valley, just as the poet had said, "like a necklace of pearls lying across the soft green throat of the valley of Anaquito." The cultivated fields of corn, beans, potatoes, lay like a great mosaic across the valley as far as the eye could see. In the north the lifting fog let the snow-capped volcano of Cayambi in Imbabura shine out with all its brilliance, and the lesser volcano, Cotacachi, reared itself beside the lake of San Pablo.

The poet took exception to the remarks of his friend: "It seems that your residence abroad hasn't nurtured your patriotism. I have never left Quito, I know nothing about the outside world except what I read, yet to me Quito still remains the centre of my life. I am fascinated by its history, the conflicts of its people with its very earth, the conquests of the Spaniards, the legends of its



COLORADO MOTHER AND CHILD PAINTED FOR AN
INDIAN FESTIVAL

gold. Here is our Quito, lying fifteen miles from the Equator, a little less than two miles above sea-level . . . the navel of the world. If we are poor, it is because the foreigners have come, made their investments, and have taken away the *riquezas*—the riches—of our country. Look at Portovelo, the mines in Zaruma. They extract two millions' worth of gold a year, and what do we get from it? A few roads, a few high salaries for those who work there. We have always been exploited by the foreigners. . . ."

At this point, I entered the argument. Without turning to look at the poet, and still gazing at the great sweep of the volcano of Cotopaxi, I pointed out to him that so far as I could tell from the literature of Ecuador there were very few native-born Ecuadorians who had contributed greatly to the understanding of the country. I reminded him that it was Father Fritz, a Bohemian, who first made systematic journeys among the Indians of the Upper Amazon, mapping the country. And he was ill-equipped, financially, by the monks of Quito for this work. The French Academicians, La Condamine, Godin, and Boulanger mapped the regions, measured the arc of the Equator, and really made Ecuador known to the outside world. Baron von Humboldt, as the first qualified naturalist, came to Ecuador and within the eight months of his stay carried on the first real experiments in the Andes, climbing, botanizing with Bonpland. It was Humboldt who influenced Bolívar to wrest the Americas from the mother country. And what about Dr. Jameson who worked for forty years in the Mint at Quito, most of the time underpaid, and sometimes paid not at all, who made the first and perhaps the largest collection of plants of Ecuador, Boussingault, a Frenchman, worked on the pressures at altitude; the Germans, Reiss and Stübel, did the first and most profound work on the volcanoes. Dr. Theodor Wolff, a Jesuit, brought from Germany by García Moreno, spent twenty years as State Geologist and wrote the best and most readable book on Ecuador. Then came Whympers, Scalter,

Goodfellow, Festa, Rivet, Salvadori, and Chapman to work on the ethnology and ornithology of the country. Americans built and financed the railroad. Max Uhle, a German, did the only serious work on Ecuador's archæology. Not one of these men could count their profit in terms of any actual reimbursement, yet they made it possible for the country to be better known and the natural resources to be properly exploited.

I had obviously gone too far, and so as not to affront the poet, sensitive for his country, I recovered quickly and acknowledged several important contributions by Ecuadorians, ending with the fact that García Moreno had established compulsory education in Ecuador before it had been decreed in England. My engineer friend, anxious to repair the damage caused by our explosive words, asked me if I had yet been to Otavalo.

"You have not? Then you must go there before you leave Quito. It is the most beautiful and interesting of our provinces. These Otavalo Indians can weave cloth of any style. Bring them a piece of English tweed and they will duplicate it. A very dexterous people, but sullen. You should really go to-morrow, for it is the Feast of San Juan. It is a gaudy affair, but interesting. You must get there in the early morning for the Fair is at its best at that time."

And so we started down the side of Pichincha. It took only one-fourth of the time that we had spent climbing. It seemed only a few moments before we gained our horses tied in the arbour of eucalyptus trees.

I felt depressed, possibly as a result of our conversation, possibly because of the sudden change in altitude, and possibly because there is something indescribably sad about the landscape of Ecuador. Perhaps it is the stillness outside the cities—the death-like repose—the sad way the Indians have of raising their great felt hats, bowing and wishing us good day, a melancholy seems so much part of the *Nichond* Indian.

CHAPTER XXVI

OTAVALO FAIR

THE early morning air was biting. Our automobile careened madly down the highway. In the back of the car were merchants from Quito going to the Otavalo Fair to purchase weavings from the Indians. They huddled close together with a woollen poncho thrown over them to keep out the piercing cold—the only visible thing above the covers were their black fedora hats.

I sat in front with the Cholo chauffeur who eschewed anything more than a weird plaid scarf, which was wrapped about his neck, the ends of it beating wildly in the air. The landscape which I had seen so often in southern Ecuador was repeated over and over again: the same type of Andean villages, the same century plants and eucalyptus trees hugging the road, the same narrow-spanned viaducts built in heroic size to bridge a mountain rivulet. It was a monotonous landscape, but since I had now become almost a part of it, somehow a friendly one.

Having risen at dawn in order to be at the Fair at the opening, by seven o'clock we had covered almost all the thirty miles which separated Otavalo from Quito.

As we rolled around a bend the chauffeur barked ecstatically:

"Look, look, the Lago of San Pablo—*que hermoso*—how beautiful."

Almost everything in Ecuador to the Ecuadorians is '*que hermoso*,' but this time he was quite right. The scene had the frigid beauty, the calm, the melancholy, which seems always to be about the Indians.

From one end of the small lake, which was not more

than three miles in diameter, reared a large mountain. Mists hung about its peak, and vapours continued to float gently in patches on the surface of the water which reflected the peaks. I could see that the Indians had cultivated this mountain up to its very peak, the chequer-board of corn and potatoes laid out in geometric patches on its sides.

The chauffeur brought his steaming car to a stop, jumped out, seized a can in the bottom of the car, and ran to the lake to get water to fill the radiator. I got out to stretch myself, following the chauffeur down to the lake, just in time to see a flock of white herons glance nervously at us and take off in perfect formation. Along the edge of the lake were the *huasipongos* of the Indians, well camouflaged by great stalks of corn. Some Indians from the nearest house dashed down to the lake, pulled off their garments, and dived into the icy water, remained for a moment washing, and then emerged to dance about until the air had dried their bodies. The men unbraided their hair, which they wear long, then re-did the whole of it in a long queue, weaving into the braiding a bit of red and green silk, for it was Fair day and a festive note was needed.

Our engine cooled and once more we sped down the narrow road, raising a blinding dust behind us.

Already all the roads leading to Otavalo were filled with Indians on their way to the market. On their heads were the mushroom-shaped felt hats we had seen so many times earlier. Under their broad-striped ponchos they wore white cotton tunics and loosely fitting white pants that came to the knees. Some wore sandals, others were barefoot; about their waists were belts—*chumpis*—decorated with symbols of their ancient religion. Strapped to their backs were their wares: large earthen jars or enormous loads of *tinajas*—dull red pots enclosed in a sort of fish-net; corn, squash, or chickens in small coops. Most of them carried woven goods, large ponchos in a riot of greens, reds, and blues.

Beside their husbands the women trotted, swishing

along in woollen skirts of red or yellow, not in just one skirt apiece, indeed, but in skirt on top of skirt, for the more a woman wears, the higher is her social position. Over their highly coloured blouses they wore gaudy glass beads strung with large Spanish-colonial silver pesos. In their arms, on their backs, were the ubiquitous babies. As the women moved along in groups they chattered in Quechua while their busy hands spun out the thread.

It is one of the most characteristic and picturesque customs of Ecuador, for the Indian women to spin as they walk. A distaff for the wool is placed under the arm and the wool is drawn from it by the thumb and index fingers, which are constantly and copiously moistened in the mouth of the spinner. In time with their trot, the women give the little spindle a whirl and the threads twirl tightly.

Into this throng our driver burst, sending the Indians hurtling to one side. He even deliberately manœuvred his car to the left of the road and bore down on some natives leading a cow, letting go a blast on his horn. The natives jumped aside, and the cow galloped madly on ahead down the road. The Cholo chauffeur burst out laughing and, when I chided him for such a useless procedure, he laughed even more broadly, raised his shoulders in an annoying gesture, and said:

“Que importa, señor?—they are only Indios brutos.”

“What difference does that make that they are only brutal Indians. Since you, yourself, are half-Indian, it would seem that you should have some feeling.”

The Cholo gave me an icy stare and returned to his driving and I knew that I had been led to touch on something that everyone feels without expressing audibly in Ecuador: the question of colour, race nostalgia, the longing for the heritage, the prestige of white blood. The Cholo—a half-caste—keenly feels the distinction that the man with pure blood places between him and the life he would imitate. Behind his smooth exterior, something feline lurks; he is likely to perpetrate extreme

cruelties and . . . where one might least expect them, as I had just seen . . . on the Indian himself. This attitude is curious, for one might think that as the Cholo knows he is, after all, flesh of the Indian's flesh, a physical sympathy might exist sufficient to create the desire to push the Indian forward; to ameliorate his existence. Yet the typical Cholo is more cruel to the Indian than the white man. He is callous toward his suffering and he will, many times, go out of his way to impress the Indian with his position as *raza conquistador*. Carleton Beale sums it up very well when he writes: 'The Cholo never quite belongs; he is doomed to an eternal inferiority complex. Despite his swift mental agility, he is a pin-cushion of emotional disorder, great ambition, vague reasoning, and baffled will. Having no deeply rooted prejudices, habits or customs, no group of *mores* to sustain him, and devoured by a constant resentment and malaise, he becomes essentially a shrewd, pragmatic individual, without principles, shuttling between inattentiveness and proud aloofness.'

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The market at Otavalo had been a scene of feverish activity since dawn. Some of the Indians had come a long distance and had travelled half the night. Letting down their cargoes, in the light cold air of the morning, they could be seen quaffing their bowls of *chicha* (corn brew).

The merchandise offered for sale, spread out on white sheeting, falls into divisions of foodstuffs, wearing apparel, and materials for weaving. Cotton, wool, large ponchos with broad stripes of colour on white or grey, brilliant *chumpis* (sashes), white *alparagatas* (sandals), the absurd felt hats, and numerous modern additions—scissors, knives, glass beads, aniline dyes, candies, etc., were offered for sale.

Over the more perishable foodstuffs the Indian had erected a square of cotton cloth, set upon a tripod of crooked sticks, shifted with the sun. There were potatoes, in infinite varieties (for Ecuador is the original

home of the potato), beans, sweet potatoes, called *cumara*, peanuts, peppers, yuccas (a tuberous root from the hot countries), pineapples from Guayaquil, large *granadillos* (resembling pomegranates), and *chirimoyas*, the most delicious of indigenous fruits. Maize was offered, steaming hot; large-grained corn called *moti*, entirely unknown to our northern cuisine.

By 9 a.m. the business of the Fair was well on its way, yet Indians continued to arrive with more goods to trade. For sheer barbaric splendour of colour and form, the Otavalo Fair surpassed all of Ecuador's pageants. One could identify various tribes of Indians by the shapes of the hats they wore. Those with flat pancake-like hats were Sambizas from east of Quito; those in white broad-brimmed felts with the crowns trimmed with red and blue ribbons were Caranquis of Ibarra. They all shuffled into the square in the same manner, dumping the loads they had carried for many miles, and began to lay out their wares. Each Indian squatted behind the products he had to offer, and those who wished to buy circulated freely in the crowd. Other groups, specializing in woollens, ponchos, and hats, were found at the Sub-Plaza, where they attracted special buyers.

As soon as the Indians had placed their wares in a permanent place, the official rent-collectors appeared to claim ten centavos to one sucre, depending upon the space occupied. This rent for space in the Plaza differed little from that collected by the tribute collectors, *chazqui cuna*, of ancient Ecuador. To-day the rent collectors enter the sums collected in a small book; the Inca's recorded their tribute items on their *quipus*, or knot records. In those days the tribute was not in money, for money, as such, did not exist, but was paid in stuffs of value. There is, however, this great difference between the collectors of old and those of to-day. Then the rule was a benevolent despotism; to-day there is a continuation of the despotism, without the benevolence.

Monks also moved about in the throng, carrying little effigies before which the Indians knelt, kissing them

obsequiously, and depositing a few reales in a large brass plate. Throughout the day the monks, in their swishing black gowns, sandalled feet, and broad-brimmed Panama hats, walked along in the long parallel lanes of natives, demanding alms for the Church.

Down the long rows of cotton, weavings, wool, peppers, chilis, corn, the Indians passed and repassed, stopping here and there to speak to someone from their 'tierra' (country), and on to another place to ask the price of such and such weaving. The women and men who squatted behind their offerings at the weekly Fair were exceedingly loquacious with their own people, but stiffened at the approach of a white or a Cholo buyer and became instantly silent, with a contempt that bordered on the bellicose. To some buyers with whom they had had dealings, knowing they would not be cheated, they were more open, yet generally they regarded any save their own Indians with suspicion—a typical characteristic of the highlander, as compared with the *costeño*, who is loquacious, jocose, and gay. I stood a little on one side while an Indian negotiated with a woman who sat behind her stack of woven cotton girdles, the delightful little *chumpis* that were decorated with beautiful needle-point of animals, monkeys, scorpions, and other traditional Indian designs. The prospective buyer indicated to the woman, who sat silently nursing her child, that she wanted a new *chumpi* for her baby who was tied to her back. They spoke in their sibilant sing-song Quechua and the interchange, at first, was in monosyllables. The woman examined one weaving very carefully, picked it up and said :

"Masna llactamasi?" ("How much, country-woman?")

The tradeswoman raised her full hand and said :

"Pischa reales (five reales)." At that vast sum the would-be purchaser dropped the *chumpi* weaving as if it had burned her hand, complaining :

"Chumpi cushac, chaica nuca auchami—your price for *chumpis* is too high"—and she went on to berate the

Indian tradeswoman in Quechua, holding her jaws tightly locked. Only her lower lip seemed to move and spew forth the sibilant syllables as if they were being shovelled out.

To this outburst the seller displayed perfect *savoir faire*. She calmly rolled up the discarded weaving and put it in its place with the others, but in doing so lowered her price to four reales. . . . The prospective buyer took a few steps away and then returned and held up two fingers. Again there was a fierce dialogue and then they settled for three reales ; the Indian woman reached into her dress, pulled out a rag in which at one corner some coins were tied and dropped three reales in the hands of her fellow Indian woman.

Now that civilized man has adopted a system whereby 'value' is expressed in terms of money, it is rather difficult to conceive of a commercial system operated on principles of value, but without coins. The barter system of the ancient Indian markets of the Andes operated something like this :

A woman wishing to sell a pile of Indian peppers arranged them neatly before her. A prospective 'buyer,' or better—'trader'—sat down opposite her with a large sack of maize kernels. Not a word was uttered. The buyer reached into her sack and extracted handful after handful of the maize. The one trading peppers fixed her eyes on the mounting pile ; the one trading maize for peppers kept her eyes on the face of the other. When the trader saw the faintest shadow of satisfaction crossing the face of the other, she stopped piling the grain and the woman with the peppers would, if she deemed the return sufficient, reach out and draw in the maize while the other picked up her peppers. But there might be considerable wrangling ; if the maize-trader believed the pepper woman too greedy, she would go elsewhere to begin the bargaining anew. Transactions necessarily took a great deal of time. ; At these *catus*, or markets, Inca law did not fix a standard of value, for this was left entirely to the satisfaction of the parties involved.

The barter system as a means of exchange sprang from a very typical social organization of the Highland Indian, whose basis was communism; not however a speculative or theoretical communism, but a system of natural growth and historical development. In the Inca system, where there was an almost complete lack of centralization of government, the highlands, composed of conquered territory, were divided into innumerable small states, which became, after the invasion of Ecuador by the Incas, consolidated into what was then known as *allusys*, units of one hundred families. Ruled by an elected head, who could only be supplanted by a military junta in case of an emergency, the land of the country was divided among the people, depending wholly upon the size of each family. Each married couple (and there were apparently no bachelors) received a parcel of land called a *tupuy*, approximately two acres. This they worked, and enjoyed the use of its products, but were not the owners of the land. When a son was born the headman gave the father an additional parcel of land and upon the birth of a daughter a half of a parcel adjacent to the families' acreage. When the son grew to manhood and married, he took his own parcel of land, held in trust, so to speak, by his father while he was reaching his majority. Then, as to-day, the fields were tilled communally. The fields of those Indians who were away at war, or about the Empire on legitimate business, were first tilled, after that the lands of the State, and then the lands of the common people. One-third of the produce from the land of the people was levied as tax, and these products were stored in a common repository in case of famine. For the upkeep of the Empire, roads, conquest, and for the State religion, another third of the produce was levied upon.

In the ancient Andean communities, as now, the basis of society was, primarily, the home, and the Indians became endeared to their own 'good earth,' since they could seldom leave it without express permission of the Inca's deputies. Their land supplied all their wants, and as Dr. Means has remarked: 'The needs of the

populace were few and the Incas had a positive genius for preventing these wants from growing.'

The Indians lived principally on *charqui* (jerked llama meat), maize, potatoes, *chuno*, and *uchu*—a mixture of frozen potatoes and hot Indian peppers. Bread was made from maize, and *chicha*, a corn brew, was made by chewing the maize grains and converting the starch of grain into sugar. Milk, butter, eggs, fowl, and pigs were, of course, unknown until the advent of the Spanish. Cloth was woven by the women and though there were no styles save those dictated by custom, the artistic taste of every community varied and the weavers produced a motley of colours and designs. Each household manufactured most of its own necessities, but gradually some specialization was introduced by reason of soil and climate conditions and individual skills. The Fairs provided the medium of exchange.

Then, as now, the Indians trudged to the weekly market and to the special Fairs in far-away places. Then they moved along that one great artery, the stone foot-road of the Incas that led directly from Pasto to Otavalo, passing through Quito, Latacunga, Ambato, and so on to Cuzco in Peru, the heart of the Empire. Down they would come from their villages, from their own *chacras*, and join the quickly moving throng *en route* to the town.

Instead of the modern automobile bearing down upon them, the Indians would be suddenly disturbed by a blast from a shell instrument as runners, clearing the road, warned them to make way for the representative of the Inca. Surrounded by archers, and carried in a litter on the shoulders of other stalwarts, this high personage answered the shouts of the Indians who stood bareheaded, repeating over and over again their :

"Ancha Hatun apu inti Churi"—"Great Lord of the Sun."

At the modern Otavalo Fair, trading lessens during the afternoon and, as dusk falls, the Central Plaza became alive with people once more, for to end every Fair there is a bit of fireworks, in which the Indian, like the

Oriental, revels. The monks appointed volunteers who erected towers on which the fireworks were arranged. Groups gathered about to watch ; others stood near the *cantinas*, drinking their *chicha*.

From one side of the Plaza came the sounds of plaintive Andean music played upon a large native-made harp and an old lute with cowhide strings and a bow of horsehair—from the other end a lonely Indian, as drunk as the satyrs that followed in the train of Dionysus, blew his pan-pipes, repeating over and over a three-noted ditty, shrill and harsh, but filled with deep pathos.

In order to finance these displays of fireworks a docile Indian had allowed himself to be chosen by the monks as the 'patron' of the Fiesta ; that is, he was to pay for everything. This honour cost over two hundred sucres—actually only twenty American dollars—but his sucres have been earned only after long, hard toil.

In the centre of the Plaza the fireworks were set off. All eyes turned skyward to watch the rockets, then toward the tall bamboo towers of fireworks which had been lighted and were going in great spurts of colour and explosions amid the shouts of the Indians. After an hour's display the last blaze broke out into a prolonged pale light, showing the Virgin Mary and the Christ, emblazoned in the blinding light of red fireworks. At once the multitude crossed itself, and the more simple of the Indians dropped to the ground in reverence.

Many of the Indians were already inebriated, having spent their profits at the *cantinas* which sell sugar-cane brandy, *aguardiente*, a State monopoly. Quarrels caused by the strong drink bring the khaki-clad Cholo police rushing to the scene to separate the disputants, giving them into the care of their wives.

The women who bore up through their liege's debauch with fine philosophical mien tied their bundles on their backs, seized their husbands, and half-pushing, half-dragging them, set off for home over the little dusty, eucalyptus-lined road, thus providing the traditional end to the Otavalo Fair.

CHAPTER XXVII

THE LAND OF THE SCARLET MEN

JULY 1936 marked the end of our second year in Ecuador. With Quito as our base, to which we periodically returned for a modicum of comfort after prowling in the jungle and sleeping on the wind-swept *paramos*, we had journeyed to almost every part of Ecuador except one section, the Province of Esmeraldas, the least known of all of Ecuador's domain. Christine was growing weary by now of our endless wandering, and longed to be sedentary for a little while at least, so we compromised: We would 'go out,' that is we would return to the States, by way of Esmeraldas. We had heard that a coastal steamer occasionally put into port there.

Esmeraldas lies over and beyond the Western Cordilleras of Quito, bound on one side by the giant Andes and on the other by the Pacific. Living somewhere in the Province were two tribes of Indians, the 'Cayapas' and the 'Colorados,' which was one of our reasons for wishing to explore the region. The 'Cayapas' were fairly well known, as they lived on a river, the Rio Cayapas, that flowed into the Pacific not far from the town of Esmeraldas, but not so the Colorados. I met no one in Quito who had been among them, no one who could tell me precisely what language they spoke, nor the best manner of reaching them.

While Christine prepared, as usual, the foods that we were to take with us, I systematically called on the various monasteries to see if there were not some padres who had conducted, in recent times, missionary work among them. At the Franciscanos I learned from an elderly

monk that during the last part of the past century they used to administer to the part of the province in which the Colorados lived, and that he had remembered seeing some of them once, but that many had died in those years from smallpox. He did not know how many there were. He knew that they did not speak Quechua. He suggested that the Department of Highways, which was supposed to build a road to that part of the country, should know something of them. After interminable false clues I at last found a contractor for the Government who knew about the Colorados. They lived, he said, in a village called Santo Domingo de los Colorados, at the base of the Andes. There were, according to him, only fifty Indians left of the whole tribe. What information he failed to provide me with concerning the Indians he made up for by recommending me to a muleteer who had made the journey many times.

This man I sought out and matters were easily arranged for beasts. I say easily, for after endless experience with muleteers I had perfected a technique for dealing with them, and it was arranged that we should meet on the other side of the Andes—that is on the downward western slope. We were, you see, slipping into the ease of tourists, for I did not wish to ride mules over the *paramos* wastes for two days when it was not necessary. We arranged for the muleteer to pick up our cargo in advance and we proceeded in a Ford truck, following the small road across the *paramos* to the meeting-place beyond the little village of Lloa.

Our truck streaked across the dusty road of the *paramos*, for in July the whole of the Andes is dry. We then cut across the mountains moving westward to the highest part of the *paramos*. Near the end of the road for automobiles we passed our muleteer with his mules. A miracle had occurred. Beyond all my belief, our pre-arrangements to meet at a designated spot had actually meshed.

The highlands of Ecuador are clearest during July and August; the heavy fogs give way to a fierce wind, and

in the morning the atmosphere is cloudless. Cotopaxi, with its white ice cap, reared itself in front of us in beautiful symmetry. In endless procession to the south were the other patriarchs, the snow-covered volcanoes of Corazon, Illiniza, and Chimborazo. We never grew tired of seeing these phenomena of the Ecuadorian landscape and this morning we had the leisure to view them as we awaited our Andean safari.

And it was not long in coming. The *arriero*, astride one of the riding beasts, suddenly came around the bend of the road. Mounting our beasts, we were once more moving on, and now, since we had passed the *paramos*, our road led downward, twisting and turning, doubling back on itself, then once more dropping down to the humid zones. From the heights of the mountains we could see the jungle spread out below us.

Santo Domingo is only sixty-five miles from Quito, but it takes three days of riding to get there. The village had no obvious *raison d'être*; its two scores of bamboo palm-thatched houses were grouped about a shabby little plaza, where the natives casually tried to raise some flowering plants. On one side of the plaza was the Mayor's office with a jail adjoining. No sooner had I issued from the Mayor's office, where I had shown him my letters and credentials, than my *arriero* pointed his hand to the other side of the plaza and said :

"There's one of the Indios Colorados."

I lost no time in crossing the plaza to see him more closely. He was short, as South American Indians usually are. His body was dyed a flaming red from the top of his head to the soles of his feet, as brilliant, as scarlet as the lips of Christine. His hair was also dyed and combed down before his eyes in a bang so long that he had to tilt his head back to see. Instead of pants he wore a short woven skirt. Across his shoulders was a small piece of cotton cloth dyed red from the colour of his body. It was not larger than a handkerchief, slit in the centre, and slipped over his head like a miniature poncho. For the rest, he was barefooted and naked. A minor festive note

completed his curious accoutrements ; on his head was a skein of spun cotton fibres that went about in a sort of halo. It was only an inch in thickness and his head of stiff, dyed hair protruded from it. The language that he spoke was not Quechua, and bore no resemblance to this *lingua franca* of the mountain Indians.

Three miles west of the settlement of Santo Domingo de los Colorados we built our camp. We chose an idyllic spot in the jungle above a high embankment which held a narrow but deep river to its course. . . . We had no permanent servant this time, as no one in Quito of our acquaintance had been to Esmeraldas and therefore would have been of little use to us as a guide. We had hoped to recruit some young boy from the village, but despite the efforts of the gallant mayor, the *teniente político*, we were not successful. A Spanish family living nearby supplied us with labour occasionally and the daughter helped with cooking.

Our camp was simple. Twenty feet long by fifteen in width, the shelter was open on all sides. Over a frame of poles, tied with jungle vines, we placed a heavy chemicalized tarpaulin. Large rubber ponchos were draped on three of its sides ; these were rolled up during the day, dropped at night. One end served as the kitchen and again we used the most simple materials. We made a wooden platform, shaped like a box, into which we put mud and rocks, cementing them over later with mud mixed with ashes—this gave us a stove two feet in depth, by again as much in width and length. Pots were held by long metal rods, and a collapsible oven served us for baking. We were prepared to cope with the servantless problem.

Christine was now a veteran of two years' experience in dealing with the food problems of a foreign country. In addition, we had just come from Quito with a full larder and were to remain only nine weeks.

In a week we were ready to begin our work in the region. At our insistence a group of Colorado Indians paid us a visit. The air was still chilly, for the sun had not



THE AUTHOR IN THE JUNGLES OF ESMERALDAS



THE WITCH DOCTOR OF THE COLORADOS, DYED IN
BRILLIANTLY RED COLOURS

A silver nose ornament hangs from a hole in the centre of his nose

yet pierced the heavy mist that veiled it, when out of the jungle opposite our camp came a group of Colorado Indians. Their bright scarlet bodies against the green background of the jungle were so entirely bizarre that had we not known they were as harmless as their colour was bold we should have taken to our heels.

The five men in the group were dressed as the Colorado we had seen before in the plaza of Santo Domingo. They were all of medium height, not exceeding five feet four inches. Their heads were uniformly plastered with the red dye and their hair was cut in the curious fashion that obscured their vision. Slim of torso, they had, none the less, heavily developed legs, the calves, especially, being hyper-developed. The feet were wide and spreading; a wide distance separated the big toe from the rest, and, like monkeys, they could pick things from the ground with their big toes, which they used with the same dexterity as their thumbs. They were accompanied by three women. Unlike the men, the Colorado women were robust; their skirts were longer and better woven. Only their faces were painted red. Their hair was worn long and allowed to flow down their backs. For the rest they were naked. Their breasts were firm and full, like those of the native women of Sumatra.

The Indians stood off shyly until I invited them within our small camp. I pulled up boxes and chairs for them and, laughing self-consciously, they sat down. We conversed in a kind of 'pidgin' Spanish, a terse, sing-song, fragmentary speech. This was our first medium of conversation. The women spoke not at all.

We began the amenities by giving them presents, tobacco to the men, needles to the women. During the presentation I made a little speech which they understood poorly or perhaps not at all. Its purpose was superfluous so far as we were concerned, but it was important to the Indians. I announced first, that we had arrived, that we wished to be friends with them, visit with them, see how they lived, and what they did; we wanted nothing from them, on the contrary, we would pay well for such

information as they could give us. If they were sick, they should come to us for medicine, etc.

How does one go about making an ethnological survey of Indians, where there is a language barrier to begin with, and where the subjects are suspicious because of the treatment they have received from white men and Cholos?

The first requirement of an investigator is amiability. He must laugh, and laugh often. The words one can learn most easily are the simple phrases: '*What is this?*' or '*What is it called?*' Once these are acquired one makes inquiries about articles of dress, plants, household items, and in this way gradually builds up a vocabulary. An investigator's best endowment is that of mimicry. If he is able to imitate their sounds, their manner of pronunciation; if he can impart to their words their own flavour, then he has broken down the highest barriers between himself and the objects of his study.

From one Colorado, who knew more Spanish than the others, I acquired my phrase: '*What is it called?*' and then I proceeded to their persons to find out what they called their various articles of dress. I pointed to the cotton skein on top of their heads and asked in my newly acquired phrase:

"What is it?"

The women laughed, which was a sure sign that I had acquired the 'flavour' of their language. Repeated, the question drew the response: "Mishoshuli."

I pointed to the skirt of the men and repeated the question: "Umbatsompa." All this was duly entered in my book.

Christine asked me to inquire about the silver bracelets the men had on their wrists. They were bands of silver or perhaps iron washed in silver, three inches wide. The question brought the answer: "Kalateshli."

Well, now we were under way. The words that are acquired must be repeated by rote. If you say them correctly the Indian will usually laugh; if you do not, and he fails to recognize the word, he will say nothing and

stare ahead as if you have not spoken at all. Ask him how the word is pronounced and he might remark: "The way you have said it."

Having covered the articles of dress, I pointed to a Colorado's nose and asked what the piece of wood was called that protruded from the tip. In the exact centre of the tip of the nose was a plug of wood about the shape and size of the head of a match. All the males had this plug; the women did not. They laughed at the question, and when I insisted, one of the Indians pulled the plug out and laughingly said: "Kimfudse." At that the whole group broke into Homeric laughter.

Further questioning revealed that the hole was punctured in the nose of young boys as they approached puberty, but their answers were somewhat vague.

It is not, however, unusual to find the American Indian puncturing various parts of his body. The women of the Headhunters puncture a hole below their lower lip, above the chin, and the men and women of the Headhunters puncture their ears. The tribes of the Uitotos and Boros of the Amazon puncture the nose with a slit made on either side.

So our first contact with the Colorados went off well. From their attitude we knew that we had created a good impression. We asked if we might visit them and one of the older men nodded his head, and with a grunt and exclamation in his language, which meant 'Let's go,' they all rose and filed into the forest.

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The jungles of Esmeraldas were not quite so luxuriant as those of the Upper Amazon, yet they were very impressive. Like all jungles, it was cool and dank within; although we were only eight miles from the Equator there was no evidence of equatorial heat. Above all the mass of verdure towered the royal palm. This smooth-trunked tree, the most majestic of all the palms, was higher than most of the vegetation, and appeared so often within the jungle that it would seem to have been

purposely cultivated. The cedars, the *lignum vitæ*, the oak, were covered with hosts of parasites. Lianas, thick as ship's cables, stretched from tree to tree, enveloped with great epiphytes.

It was within such a forest that the Colorados built their houses. From a section of the virgin forests, which they cleared, they selected a place, usually on a knoll, out of the reach of flood, for their dwellings. The jungle was full of paths, but very soon we were able to select the right path to our destination. Before we came to the Indian's house we walked through groves of banana stalks. Beyond the banana plantations and in the centre of the forest was the home of the Colorados. It was not a spacious dwelling like the homes of the Indians of the Amazons or as well constructed. In the Amazons the homes of the Headhunters are both fortress and dwelling; in the jungles of western Ecuador the Colorado has no enemies, save the Cholo and the Negro, and these make no direct attack on him.

His house, therefore, is simple. It is about twenty feet long and composed of two sections. There is a large unenclosed part which consists of a high sloping roof of palms with seats of balsa wood placed for visitors. In an enclosed part behind this is the house proper, where the family lives and cooks and where such property as they possess is stored. The fire is in the centre of the dwelling; corn, beans, squash, hang above. Skulls of monkeys, deer, agoutis are suspended from poles from the thatch. These are amulets. Without these mementoes of the kill, the Indian believes that future hunting will not be successful. Beds are merely split pieces of balsa wood, raised from the ground. The soft balsa wood is held together with wooden pegs. At night they sleep directly on the hard wood, without pillow, of course, and covered with only a thin piece of cotton sheeting.

When we arrived, the mother of the household came to the door, grinned at us, and returned to the kitchen. There she was boiling bananas in a large earthen pot

over a three-logged fire. She muttered something to a small boy and the little fellow, wholly naked, slipped out of the door as unobtrusively as possible and ran to tell his father that the white people had arrived.

Meanwhile, we allowed our eyes to roam everywhere, for we were naturally as curious about the Indians as they about us. Outside of the house was a crude canoe, filled with tiny red seeds, shaped like those of a grape. When I picked up a handful, a deep-red stain was left on my hand.

"Look, Christine! *Achiote* seeds? This is what they dye themselves with."

Christine moved over and put her hand into the canoe and picked up a handful. "It's a wonder," she said, "that they don't poison themselves with it, dyeing their bodies with the stuff continually. But no, of course, it's a vegetable dye. They only do to their bodies what we women do to our lips."

"Did you know," I asked, "that this is the colouring used in American cheese and oleomargarine? Well," I confessed, "neither did I, until recently."

Achiote is an article of commerce in Ecuador. Tons of the seeds are shipped to France, Germany, England, to be used as vegetable dyes. The ancient tribes once used these seeds for dyeing cloth. They used it together with cochineal and its name is derived from the Aztec word *achiotl*. It should have more use in the future, if some enterprising business man perfects the method of the Colorados who remove the colour when the seed is fresh. It might have some commercial application if it could be concentrated and used for women's lip-stick. The seeds possess a natural wax testa, or shell, which accounts for the fact that when the Colorado puts it on his hair the coiffure remains stiff as if something else had been placed in the dye. It is only the natural quality of the seed. Christine tried it as lip-stick and it was just as serviceable as commercial lip-stick. The Colorado, most appropriately, is called the Red One.

Now it is not unusual for an Indian to paint himself

red, but it is very singular for him to paint the whole of his body. Behind the act there may be a blood ritual. Primitive peoples believe that whenever they come in contact with genii of the external world, the evil that these spirits bring can be checked by blood. Something of this blood symbolism must lie back of the painting of the body with *achiote*. All the Indians that I have seen in the tropical Americas use *achiote* in some such way. The Headhunters put it on their faces before fishing, before entering a house other than their own, before the hunt, in short, before any event which threatens danger. To the native, who in his anthropomorphism has animated all nature with spirits, danger threatens all the time. In Central Australia, where the bush *achiote* does not grow, the primitives cover themselves with a substitute: red ochre. Ochre, or *achiote*, because they resemble blood, become blood.

Blood to the natives has magical properties it does not have for us. They reason something like this: since blood is life-giving, since when one loses it, one dies, and when one possesses it, one lives, blood has a sorcery of its own, apart from the sum and substance of the body. It is for this reason, perhaps, that he thinks that if he covers himself with it he will be safe from harm. In the Andes the Quechua Indians, and even the Cholos, put the *achiote* into their food; they do not know why they do it, but their soups, rice, potatoes, always are coloured red with the seeds. Perhaps for taste? I doubt it. The use of *achiote* for a condiment is most dubious. When we put it into our mouths we could discover no taste at all.

Eventually our Indian friend returned. He had been working in a sugar-cane field and brought home some strips of cane to chew. He had on crude shoes, which he had made from the hide of a steer. Instead of wearing his little skirt he appeared in a pair of pants, acquired, no doubt, from the Cholos of the village of Santo Domingo. At first he paid no attention to our greeting, a discourtesy which puzzled us. He went behind his house and changed into his skirt, then re-

appeared and greeted us pleasantly. We had obviously made a *faux pas* : we should have ignored him in white man's clothing ; he did not want to be seen except in his traditional dress.

Our Colorado friend was called Compadre Carlos. He had been baptized by a Spanish Padre of the Order of San Augustin who came once a year to the village of Santo Domingo. The Colorados have two names, one in their own tongue, which is usually the name of an animal or bird, and another given to them by the padre on their baptism. When they refer to themselves in Spanish they call themselves and their fellow Indians by their Christian names. When, however, they are by themselves, such sophistry is forgotten. Naturally they are not Christians. They have their witch-doctors to cure them and dispel the demons that live about them ; their acceptance of the Christian names is a gesture of acquiescence, the cause of which I never learned.

With Carlos we left to visit old Zaracai, the chieftain of the tribe. Known as a great sorcerer throughout the region, and even beyond the confines of the Esmeraldas jungle in the Andes, Zaracai was supposedly able to penetrate the Unknowable. Such a reputation could not exist without widening the paths to his door, and as soon as we came on the general 'via' to Zaracai's house we found it was a much-travelled road, no longer a jungle path—the hoof-marks of animals were plainly visible.

The house of Zaracai was three times the size of those of the other Indians. By the pigs and the number of chickens he possessed, we judged him to be a very successful sorcerer. Hanging from the roof were two marimbas, made by the Indians from the hard black wood of the chonta-palm. To carry the tones of the marimba, large bamboo cylinders came down from each note, and the diapason was complete though not regular. The instrument had three octaves with concord of the last and first notes. I picked out a few tones on it while we waited for the great sorcerer.

When Zaracai came we were thoroughly disappointed.

I had expected to see a great hulk of a man, decked out with all the accoutrements of the black arts. Instead, here was a little old man, wearing not the clothes of his people, but pants, shirt, and coat, like the Cholos of the village. His hair was grey, his skin faded almost white, and his eyes had that peculiar glassiness that comes with age. He was small, bent over; he spoke in Spanish with little accent. Some said that he was over a hundred years old. Of his own age he knew little, only that the padres had taken him as a boy to Quito, and in that time García Moreno was President, in which case—as the date was 1861—Zaracai was not much less than ninety years of age. He had considerable information about his tribe. After we had exchanged the usual pleasantries, and I had explained why I was here, I began to shower him with questions. How many Indians were there in the region? Two hundred and fifty? No more?

“No, señor,” and the old man sadly shook his head, “when I was young there were thousands, but *viruela* (smallpox) killed them all.”

“And what is the tribe called? Colorados is a Spanish name.”

“We call ourselves *tsátchela*.”

“What does that name mean, Zaracai?”

“How am I to know, I never gave it to us.”

Eventually I found out that *tsátchela* is the plural of *tsatchi*, the word for man. The Colorados then, called themselves simply ‘men.’

“How then did the *tsátchela* come to Esmeraldas? Did they have any legends concerning their origin? Didn’t Zaracai know some legends about the Colorados?”

“I know only *tsátchela* have been here long time, maybe long time ago, my father say *tsátchela* come from Sierra. For long time we fought with Indios Bravos to north. Now for long time we live at peace. White man bring smallpox, sickness, and we die much. Long time ago all this land,” and he stopped to sweep the whole country with his arm, “all this occupied by many *tsátchela*, to-day we are small, and live in *pueblos*. Santo

Domíngo this way and San Miguel, short walk, this way," and he pointed to the south.

Old Zaracai was not alone in his ignorance of the 'origin' of the Colorados. Not only this tribe, but all the tribes that once occupied Esmeraldas are something of an ethnological mystery, due as much to a lack of systematic work among the Province as to a hiatus in the old literature concerning them.

There has long existed a legend of a tribe of immigrant giants called the *Caras* or *Sceys*, who, in the late eighth or ninth century, reached the coast of Manabi near the Bay of Caragues. After some time spent on the coast they are said to have migrated through the forests of Esmeraldas and about A.D. 1000 to have entered the inter-Andean region. Having conquered the Kingdom of the Quitus, extending their kingdom to what is now Colombia, they made a series of alliances with the tribes about Ecuador, and they were subdued only after the legions of the Incas came in 1489. The present-day Ecuadorian historians question this 'coastal invasion' hypothesis of Padre Velasco, the man who first wrote of it. According to their theory the present Republic of Ecuador was, in pre-Colombian times, a rich and varied mosaic of indigenous tribes which all spoke a dialect of the Chibchan tongue.

The Chibchas existed contemporaneously with the Incas of Peru. After taking Quito the Incas did not seem to attempt a conquest of the Chibcha territory which occupied the highlands of Colombia. The Colorado Indians and the other tribes that once existed in Esmeraldas are rather closely related to this Chibcha civilization. Although excellent goldsmiths, the Chibchas never seemed to have developed their material culture beyond a simple wooden dwelling. Some of their customs, such as dyeing their bodies with *achiote*, puncturing their noses, and cutting their hair in a short crop are the same as those of the Colorado Indians. In addition to this the language of the Colorado Indian and the Cayapas tribe, who live farther north in Esmeraldas, speak a language related to the Chibcha, showing their

rather close affinity to this civilization. Most of the tribes of Esmeraldas recognize the region about Quito¹ as their traditional home. The weavings, for example, of the Cayapas tribe and the Otavalo Indians of the highlands are very similar, showing another cultural affinity that supports this deduction.

As the Indians of Esmeraldas speak Chibcha tongue it then follows that the original inhabitants of the highland being regions of Quito were of a Chibcha culture (before conquered by the invading Incas) and were, indeed, 'a varied mosaic of tribes speaking the Chibchean tongue,' as some of the Ecuadorian scholars insist, and not a mysterious tribe that came down on rafts to conquer the highlanders in the tenth century.

Commercially, the region of Esmeraldas has been much neglected; as much in the colonial times as it is now. The first thought given to its possible importance was when the English pirates began to threaten, sabotage, and raid Guayaquil. The Viceroy of Peru commissioned one, Don Pedro Durango Delgadillo, to find a direct route from the coast to Quito by way of one of the rivers. The idea was to continue the expedition until the river was no longer navigable and then cut a road from that part up through the Sierra to emerge at the inter-Andean city of San Miguel de Ibarra, which lies sixty miles north of Quito. This expedition ended in failure.

The Viceroy sent other emissaries to make this highway to Quito, but none had any appreciable success until the selection of Don Pedro Vicente Maldonado of Quito, who poled up the Esmeraldas River into the heart of the Colorados country and established on Rio Blanco (the upper reaches of Esmeraldas) a port he called Puerto de Quito. After indefatigable labour he built a road that led to Quito, and, with that an accomplished fact, he was made Governor of Esmeraldas. It is also due to his

¹ To those who wish to push their interest on this subject I refer them to my ethnological work: *The Ethnology of the Tsáchela (Colorado) Indian*. Museum of the American Indian. Heye Foundation, New York. No 51, 1939.

travels that we know something of the inhabitants of the region. When the French Academicians arrived to measure the arc of the Equator he joined them. He travelled subsequently with the French all over Ecuador, making in his travels an excellent map of the country.

The map of Maldonado is of extreme interest, for on it he shows that the Colorados once formed two tribes, one he called 'Colorados of Santo Domingo' (which are the present inhabitants of the region), and another, or more southerly distribution, called 'Colorados de Anga-Marca.'

This latter tribe was located on the upper reaches of the Guayas River, in direct line with the volcano Chimborazo. In the legends of the Colorados the volcanoes of Cotopaxi and Chimborazo play a very important part, yet these volcanoes are not visible to the Colorados from their present locality to-day. It has been inferred that once this tribe lived higher in the Andes than they do at present, and the map of Maldonado confirms this.

I cannot locate in literature any reference to the first visit of the Spaniards to these Indians. The first visit might have been made by one of several expeditions. The most likely is that of Sebastián de Benalcázar, the conqueror of Quito.

In the mass of colonial literature on Ecuador there is scarcely a reference to the Colorados except that of Stevenson, an Englishman, whose *Descriptive Narrative of 20 Years' Residence in South America* (1810), is one of the most readable books of its time. He was one of a large group of English and Irish men who travelled in Spanish America and later joined the Spanish-Americans in their revolt.

For some years he was private secretary to the Captain-General of Quito, and later, the Governor of Esmeraldas. In his later duties he made several lengthy expeditions into Esmeraldas.

Stevenson visited the Colorados at this time, and it is from him that we possess the only exact information about them, until the coming of Dr. Paul Rivet, the

French physician, in 1895. Stevenson found at Santo Domingo a small church and apparently nothing else. Each Indian, from the age of eighteen upward, paid the parish priest one dollar annually, which was the priest's only stipend. In default of money, they paid in raw bees' wax. At the time of Stevenson's visit (in 1802) the tribe numbered over three thousand (to-day it is two hundred and fifty). He said that in his time the Colorados' hair was cut 'round and hangs like a mop' and insisted that the hair 'was held in place with a fillet of silver lace.' His description of the Colorados tallies exactly with their appearance as they are to-day.

CHAPTER XXVIII

COLORADO BACCHANAL

AUGUST, the height of the dry season, is *fiesta*-time among the Colorado Indians ; it also is the time that puberty ceremonies are celebrated. The young boy who, having reached the coming-of-age, was to have his nose punctured, was a personal friend of ours. Called Nicolás by the Cholos, his name was Kototo in his own language. Kototo means frog, and, indeed, the young Indian boy was well-named, for he was so full of animal spirits that he was always jumping about like the creature from which he was named. As we employed him to help locate an 'Umbrella Bird,'¹ for which we were searching, and other animals of the forest, we grew to know him more intimately than the others. He confessed that he did not look forward to the nose-puncturing, but if we would like to attend, he would have another Colorado take us when the time was ready.

Such a ceremony is for the Colorados an excellent excuse for a debauch. As the rainy season this year had been unusually long, lasting for eight months, they, in consequence, had not had a drinking bout for a long time. This nose-puncturing ceremony, called *kimfudse*, began the Colorado 'social season.'

The Indian prepares for his drinking bouts on no small scale—there may be three, four, perhaps seven days of continual dancing and drinking. In anticipation of the *fiesta*, large amounts of brew have to be manufactured. First, the Indian at whose house the feast is to be held begins by felling a tree and carving out a long crude

¹ See *On the Capture of the Umbrella Bird* (*Cephalopterus penduliger*) By Wolfgang von Hagen. Proceedings of the Zoological Society of London, Series A, vol. 108, Part I, 1938.

canoe, then this canoe is pulled over to a primitive mill, where sugar-cane is passed through two wooden rollers. The juice pressed from the sugar-cane stands in the canoe. The next process is not very appetizing. Women sit about in a semi-circle and chew boiled manioc tubers, then spew out the substance (of course, saliva and all) into the sugar-cane juice. The object is to bring about fermentation more rapidly, for as the women chew the manioc they transform the starch into sugar. The brew is then covered with banana leaves, tied down with lianas so nothing can get into it. In three days a very potent drink will result.

I did not go to the *kimfudse* ceremony until the second day, for I was told that nothing happens the first, when the Indians are renewing acquaintances. It takes some time, anyway, for them to get drunk.

Christine, who had attended such Indian brawls before, decided to remain in camp, so I set out, accompanied by one of the Colorados who knew the way. From a great distance we could hear the celebrants' singing. As usual, the house was hidden behind a veritable forest of banana stalks. When we came to the house in the cleared section, I could see about fifty women, men, and children moving about, for the festival was at its height. The marimba was giving forth bell-like tones, the drum was throbbing, and rattles were adding their rhythm to the dance music of the Colorados. Standing off for a while we watched the Indians perform. The dance itself was quite disappointing as it was not a tribal dance, but an imitation of the Cholo dance (an absurd fox-trot) of the village. To begin with, the men and women were dancing together, something seldom allowed in primitive ritual. The movement was graceless and ended in a muddle, for the men were now feeling the effects of their first night's debauch. The Indians' ritual dance is usually a stamping and slapping of the feet accompanied by a chant.

When we did enter at last, the Indians gave a shout and came up to us in a group. As usual, they were dyed red from head to foot, but in honour of the festival they had

added black lines all over their bodies. Each was painted a little differently, the black lines going horizontally, or criss-cross; their stiff red coiffeurs in the gleaming sunlight were like balls of fire. Their eyes were yellow, jaundiced from the drink they had consumed. They welcomed me boisterously, throwing their arms about my shoulders and shouting greetings to me in their language and then, with drunken gibberish, dragged me to the enclosure where numerous Indians sat eating and drinking. At our arrival the marimba had stopped playing and the dancers gathered about us. The women, surrounded by their children, sat apart from the men. Most of them wore newly woven skirts; their faces were painted red, and over their whole bodies were intricate patterns of lines. The children, too, were highly decorated. About their necks the women had strings of beads among which were vanilla pods, small perfume bottles, and mirrors. The colour that was lacking from the ceremony was made up for by the appearance of the Indians. I could only regret that I had no colour film with which to record the chromatic fantasy of red, black, and green.

Kototo was ushered into the square accompanied by a great hulk of a man, a man immense of stature for an Indian. Both of them seemed drunk, and Compadre Carlos, my Indian guide, leaned over to me to explain they had drunk *nepe*, which I was later to learn was a strong narcotic.

The large Colorado was Alej ndro, the rising Shaman. Zaracai, the 'witch-doctor emeritus' of the Colorados, as he grew older, was having his power usurped by this Alej ndro, now considered to be the most powerful of the Shamans. His incantations, it was said, could dispel the evils of the world that threatened the Colorados and (for a fee) he could summon the wild pigs of the forest for the huntsmen. In short, he was in very intimate communications with the spirits.

Taking a black thorn, three inches long, as sharp as a needle, the witch-doctor proceeded to bore a hole in the tip of the nose of little Kototo. The others gathered

about. The lips of the witch-doctor moved as if incantations were escaping them, but it was done in a whisper. Kototo clenched his fists, his legs straightened out as if in a pain-spasm, but he did not utter a cry. In a few minutes the thorn had penetrated the nose, into and through the left channel, and blood flowed. The thorn remained within the hole as Alejandro manipulated it to enlarge it. He passed through a bit of string, letting the twine hang out in front of the hole. Then Kototo was released; he had come of age. Kototo, his eyes filled with tears that hung suspended on his eyelashes, his lower lip shaking with suppressed emotion, walked off into the forest of bananas that surrounded the house.

The Colorado bacchanal continued.

There was no fighting as they became more profoundly inebriated; the men continued to quaff gourds of their drink and I drank also, since custom demanded that I do so. The drink was quite potent, with a taste reminiscent of strong apple cider. The Indians consumed many quarts apiece and already a few of them had fallen to the ground in a drunken stupor, while the rest drank and danced with exuberant spirits. The performers on the marimba kept up a steady stream of primitive music; two Indians performed, one carried the 'melody,' the other the 'bass,' but not in the sense in which we are accustomed to use the terms. One simple musical phrase was played over and over again, the only variation occurring when one of the drunken players struck a false note. Yet the number of 'pieces' was considerable. The variety of melody was unusual for primitive American Indians and the reason for it was the marimba, which is a 'cultural loan' from the negroes. Wherever such an instrument appears among the American Indians one can posit some contact with the negro. (In this instance the Colorado Indian had 'borrowed' from the negroes living on the Pacific shore of Esmeraldas.)

In the late afternoon the *fiesta* bogged down from its own inertia. Most of the Indians fell when the fumes of their intoxicants, which they call *malakachisa*, claimed their senses. As they lay strewn over one another the



COLORADO WOMEN SIT PATIENTLY BY WHILE THEIR LORDS AND LIEGES CARRY ON A BACCHANAL FESTIVAL



INTOXICATED COLORADO INDIANS PERFORMING ON
THE MARIMBA

women brought banana leaves to cover those who were exposed to the hot rays of the sun. The picture that these scarlet bodies made against the green leaves was impossible to record in a black-and-white photograph. It is something one must see with one's own eyes.

These *fiestas* are the only relaxation that the Colorado Indian has. He asks nothing from the government that rules over his territory. His honesty, the like of which I have never met with in either Indian or white man, is amazing. He is monogamous, either by custom or by the influence of the Spanish padres. In a way monogamy is his undoing, for if polygamy could be practised the resulting number of children would in some measure offset the horrors of de-population by smallpox.

In all the years of his tenure of the office of mayor, in the village of Santo Domingo, the *teniente político* has never known one Colorado to kill another. They fight, but this is when the Cholo merchant sells them sugarcane brandy, a drink Indians cannot assimilate. Intoxicated because of it, they will fight in the plaza, not with gun or knife, but by cuffing each other with the silver bracelets they wear. Sometimes these cause gashing wounds on head and face. Then the disputants are lodged in the jail of the village and fined by the authorities. Here the evil effects of white rule can be seen. They sell the Colorado Indian the liquor and take every bit of money he has, jail him when he is drunk and fine him so many days of labour for being drunk, the labour usually to be worked off on the *hacienda* of the mayor of the village.

Treat an Indian with the respect, the consideration, that you show a white man, and a more honest individual you will find nowhere. Our small open camp was built a half-hour's walking distance from the dwellings of the Colorados. We had in our camp, shot-guns, shells, munitions, food, money, and other material which they could use. When we were gone the camp was left unguarded, yet not once in the nine weeks we lived among them did we ever miss a thing. And would this happen in 'civilization'?

CHAPTER XXIX

NEPE—‘THE DRINK THAT MAKES ONE BRAVE’

IN time I acquired the respect, if not the friendship, of Alejándro, the ascendant witch-doctor of the Colorados. With gifts, judiciously given at the right time, I secured permission to inquire into the plants used by the Colorados in the cure of patients. I have spoken of the narcotic, *nepe*, which was drunk by the witch-doctor on the day of the *kimfudse* ceremony. The effects of the narcotic were very evident, for the whites of the eyes became yellow and the pupils danced. In the past I had had considerable experience with the preparation of this dream-provoking elixir of the Indians of South America. Among the Headhunters it is called *natema*, and among the Quechua-speaking Indians it is known as *ayahuasca*, ‘the vine of the souls.’ The narcotic comes from a vine which is never seen (at least in my experience) in free nature. It is cultivated by the Indians who plant it next to a large *chonta*-palm, which it uses for support. At its base, the vine is about an inch in diameter.

No one knew much about this plant until it was ‘discovered’ by the English botanist Richard Spruce in 1858. Before that, naturalists and travellers spoke of a drink of the Indians of the Amazons, a drink which made them brave, caused wars to break out, and rendered the most docile and cowardly Indian raging with courage to do battle. Spruce found it belonged to a family of *Malpighiad* which he had never known to have strong medicinal properties. For some time ethnological investigators were prone to dismiss the narcotic’s effects as largely those of self-hypnosis. I had seen

what it did to the Headhunters, although their witch-doctors were far more secretive than those of the Colorados. I asked Alejandro if he would let me watch him drink this narcotic, *nepe*. 'No,' he would not, but if I spoke to his son-in-law, perhaps I could arrange the matter with him.

Accordingly I did so. The son-in-law was heavy set like Alejandro, the whites of his eyes were yellow. As he was still a beginner in witchcraft, his 'cliente' was small and he did nothing, of course, to encroach on the practice of his father-in-law. We bargained:

"Caru," for such was his name, "I would like to see you drink *nepe*. I would like you to have another sick Indian go through the cure, same way you do other times."

Caru was not over enthusiastic.

"*Nepe*," replied he, "not powerful when man not sincere."

I assured the young witch-doctor that I was very sincere, and moreover, I would make him a present of a new shot-gun (a muzzle-loading gun made in Spain that costs about \$3.50).

Any possible insincerity in my desire to learn about *nepe* was forgiven when I made this astounding offer. He named the night. I named the day. I wanted to photograph the various stages and flash-light at night would put the witch-doctor and patient to flight. I insisted on the afternoon, but Caru told me that the 'powerful ones' came best at night. At last, however, I won out, but I judged that there would be no genuine cure; that what I should see would be a sham.

The witch-doctor is called *puna* by the Colorados, and the place where the cure takes place is a skeleton structure with a roof, called the *chika éya népe chuchichu*, or the house-where-the-*nepe*-is-drunk. The place was scrupulously clean; a long balsa wood bench was on one side, another smaller one on the other. Masses of balsam and candle-grease on the floor suggested that the 'cures' really do take place at night. I followed Caru to a *chonta* tree

where he cut off the stems of the *nepe*. On to a leaf Caru scraped the epidermis of the root and carefully burned it. Then the stems were beaten with a mallet, put into a pot, and boiled. While the stuff was boiling I asked him what is the cause of illness and was told that a *yúkang*, a demon, possesses an Indian, and then he is sick. This concept is not unusual. Indians believe that disease is caused by a spine (usually the thorn of the *chonta* tree), and may be likened to the old world whimsy of the 'fairy dart.' Treatment of the disease consists of removing the thorn by magical incantations.

While stirring the brew, Caru took from under the red cotton sash about his waist a long silver pin. At one end, dangling like a shriner's insignia, was a silver crescent. The silver pin was about five inches long and an inch below the crescent was a small cup. Caru passed the pin through his lips to moisten it, took the wooden plug out of his nose, and inserted the silver one so that the crescent hung from one nostril, and the pin protruded from the other. The Colorado does not work silver, but gets his bracelets and the nose-pin, which he calls *sopué*, from Cholo traders, who, I would assume, have them made in Quito. The Colorado never developed beyond primitive culture, and I am sure did not manufacture metal instruments. Therefore, the silver and the craft of working it comes from some contact in pre-Colombian times with the people of the highlands.

When the *nepe* was ready it was poured out into a half gourd; a banana leaf, made into a sort of stand, held the cup, and the narcotic was allowed to cool. When it was tepid the witch-doctor began to drink it. He drank most of the contents of that gourd and prepared another. After he had consumed a litre and a half he walked, a little uncertainly it seemed to me, to the bench, where he spread out a cloth and placed five egg-shaped black stones on it. As the effects of the narcotic increased the pupils of his eyes were clearly seen to dilate. He drank more, but instead of swallowing the liquid this time he

sprayed it across the stones, ending the expectoration by blowing—continuing this until the third calabash of *nepe* was emptied.

In ‘curing’ a patient of disease the patient also drinks the *nepe* until both are under the influence of the narcotic. Hallucinations fill their dreams as they join hands and dance about the stones, in what they call the *shukade*. The medicine man, meanwhile, chants his own litany of black magic. Eventually ‘the sick one’ lies down on the long bench and the witch-doctor hovers over him in delirium. Suddenly he slips close, seemingly pulls out of the man’s side a thorn (which he has held between his fingers) and the first part of the ‘cure’ is effected. I believe that hereafter the medicine man gives some concoction of medicinal plants, depending on the analysis of the disease. Usually he administers herbs of actual medicinal value in addition to the magical narcotic. Although the pharmacopœia of the Colorado is not impressive, they do know numbers of plants, quinine, ipecac, etc., which possess definite therapeutic power.

The psychological value of the stones must not be overlooked. They are black, usually volcanic rocks, and the medicine man has selected them on the basis of divine intuition. He claims that only a witch-doctor can know what stones to choose. Since the volcanoes of Cotopaxi and Chimborazo are believed to be the abode of sorcerers (hence their eruptions), the stones selected are supposed to come from these sources and to be possessed of deep magical power.

In respect to the narcotic vine *nepe*: the stems of the vine were ground into a fine powder by a well-known chemist, Dr. Harvey Seil of New York. Upon analysis he found that the narcotic possessed three alkaloids of extreme potency. These crystals are at present in the very capable hands of Dr. McKeen Cattell of the Medical Centre at Cornell University, undergoing a series of experiments and in which he finds it ‘very active material, producing effects on the central nervous system.’ In the future we may hear more of this narcotic. Perhaps it

will come into practical use some day like many of the primitive drugs of the American Indian.

When I returned to the house of Alejandro, guests had arrived and had spread themselves under the front of the house. They were Cayapas Indians who had walked five days from the north-west to visit Alejandro for treatment. There were three men and as many women with their children. Two of the men and one of the women were obviously quite ill. One was pale and weak with a swollen spleen and was obviously suffering from malaria. It was a tribute to the growing reputation of this Colorado witch-doctor that members of another tribe disregarded their own Shamans and came for 'treatment' to him.

The Cayapas were quite different from the Colorados, with powerful arms, for the Cayapas are river people. They construct well-balanced canoes, beautifully painted with red and black designs. As they live on the lower reaches of the Cayapas River, they spend much of their time going back and forth on the river and therefore speak good Spanish. Although they have been under the influence of the Christian culture for centuries, their native culture has not been undermined. The women make the most beautiful primitive weavings now to be found anywhere in the region of the Pacific coast. Figures of monkeys, turkeys, and other denizens of the forest are woven into the design of the cloth used for skirts for the women and pants for the men. The weaving of the Cayapas is the best that I have seen in modern Peru or Ecuador.

The Colorados weave, but their designs are limited to a series of black and red lines on a white background. The Cayapas, the Colorados, and the Cuna Indians (called San Blas) of Panama, all descend from the same basic Chibchan culture and their languages are somewhat similar, although the Cayapas and the Colorado can scarcely understand one another. The only common tongue is colloquial Spanish patois. Nor does the Cayapas dye his body as does the Colorado. The designs on their faces are done with *achiote* mixed with jaguar

fat, in intricate prismatic effects and geometric designs. They have adopted much of white culture, and their population is ten times that of the Colorados. Blow-guns, fine canoes, nets, blankets of bark cloth, weavings, arrow poison, are still made by them. Among the Colorados who, on the contrary, have never allowed themselves to lose their ancient customs of dress, native culture has severely declined ; legends, customs, the art of making instruments, and weaving have gradually fallen into decay.

The Colorados are a dying tribe, a *raza conquistada*, conquered, not so much by the white man, as by the by-products of his occupation of the South American Continent.

CHAPTER XXX

ESMERALDAS

IN September we had to leave the jungles of these red men. We both had the feeling that we were leaving a people who were in the last days of their curious culture. We bade them good-bye, secured mules from the mayor of Santo Domingo, and were off into the forest, following the road that in the last years had been made by the government—meant for an automobile road. Well-graded sections adjoin others where there has been only rudimentary digging.

On the first day we passed two houses by the side of the road, not at all like the houses of the Cholos in the village of Santo Domingo, but thatched with nicely split shingles; the construction following the cottage type seen in the high Swiss Alps. I remembered that it was about here that fifty Austrians had settled in 1927 and formed a colony in the upper province of Esmeraldas.

At some distance from the houses a man was clearing the weeds that grow so quickly in the road. When we came up to him we saw that he was not a native Ecuadorian. His eyes were blue and his hair was blond, although his skin was bronzed from the sun.

"Guten Tag," I greeted him.

At these words his face became wreathed in smiles and in heavy Austrian dialect he asked us all sorts of questions. "Who are you? Where are you going?"

We told him of our residence among the Colorados.

"Too bad that I did not know you were here," he continued. "I heard that gringos were in the vicinity. But you know gringo means anything here, from Greek to Chinaman. You are Americans, aren't you? Ja. Ja. I could have helped you. I have been here for five, no, seven years. Look, now, I live alone. There are only three of us here now. The colony is all gone. What

fools we were ! The government invited settlers and we came from Austria. You know about our position in Austria after the *Weltkrieg* ? Anything was better. Well, fifty of us came. They put us down in the little village of Mindo. We were to have roads, electric light, machinery, and oh, so many things. In three years' time we received nothing. Many died. And now we are scattered all over Ecuador, that is, those that remain."

"Do you take care of the road ?" I asked.

"Yes," he sighed, "I take care of the road. I built my house close by thinking that traffic was coming. The engineers said that it would be through in 1927—we are now in 1936 and you can see for yourself."

"Can you tell me," I inquired, "why first we come to a beautiful stretch of road, levelled, graded, the grass cleaned away. Then the next bit is only half finished. Next you enter the forest and when you come out you meet another beautiful stretch of road again ?"

"Ja, Ja, *natürlich*, I can tell you. The government puts aside \$25,000 for building a road one hundred miles long that begins at eleven thousand feet altitude and then goes down to the jungle and crosses many rivers. Why \$25,000 isn't enough to build five miles, to say nothing of a hundred miles."

"But why," I insisted, "the patchwork. Why don't they continue one stretch until the money gives out ?"

"I come to that," he said. "The mountain Indians don't like to work in the jungles and the government pays them three sucres a day (which in your money is about eight cents). To induce them to come down they give them fifteen to twenty acres of land in addition to salary after they have worked on the road a hundred days. Each contractor is given two hundred yards to do and he begins anywhere he wants to. In the road you see the pattern of their souls. One man finishes his part, another not at all. Well, now I wait for the traffic. And it will never come in my lifetime. I was young when I came here ; I thought after fighting in the War at seventeen that there would be a new start for me in Ecuador. At least I have gotten one part of my dream : I have

always, always, wanted to be where the Equator was and my little house that you passed by, it is right on the line."

He changed his tone: "And where are you going now? To Esmeraldas? Have you made arrangements for a canoe in advance?" I said I had not. I had understood that we took the road as far as Quininde, which was three days' ride from Santo Domingo village, and there at the river we could get canoes.

"A mistake!" he cried. "After my house you will meet only negroes. They are the enemies of the mountain people. And the people up there," he pointed toward the Sierra, "are deathly afraid of them. They call them *macheteros*, but they are very nice. See Alfredo at Quininde; tell him I, Tischhauser, the *Austriaco*, sent you, and he will give you a canoe to go to Esmeraldas."

The sun was gradually sinking and we had to make five more kilometres before we put up for the night. Our Austrian seemed so sad that I hated to leave him. He had been happy for a moment, speaking to someone other than a native of Santo Domingo and an occasional Indian. We shook hands with him and waved: "Auf Wiedersehen!"

"Auf Wiedersehen!"

But we knew we should never see him again.

At the end of the third day, at dusk, we came to the village of Quininde. On a high promontory forming a triangle between the confluence of two rivers, the Quininde and the Rio Blanco, were two scores of houses set on the palm-lined embankment. This was the first negro settlement we had seen.

The houses, some with metal roofs over-thatched with straw, were all constructed of split bamboo. In streets, small, neat, and clean, little negro children played. An oil lamp was even set up in the middle of the one wide street. It might have been a scene in the Southern United States. Seeing the negroes here, one is at once prompted to speak to them in English, which none of them speak, of course. They are descendants of slaves from a negro slave ship which was wrecked on the coast of Esmeraldas in 1650. Here the slaves had put their Spanish captors to the knife and regained their freedom.

We had no difficulty getting a canoe to cruise down the river to Esmeraldas. The negroes were kindly as they always are, when they are not forced to take a place in a surging economic life, for which, emotionally, they are not equipped. Their Spanish, like the English that the North American negro speaks, is spoken disarmingly with the same softened pronunciation.

At this point the Rio Blanco is two hundred yards wide; very deep and with a current of six knots. The river rises on the eastern slopes of the volcano, Pichincha. At Santo Domingo the river receives its first large tributary, the Rio Toachi, which also comes from the mountains near Quito. Beyond the point where we were standing the Incas placed fortifications; there is evidence of terracing, showing that a civilized people once lived here. It is, like all of Esmeraldas, a very fertile field for the archæologist, as well as the ethnologist.

As the Rio Blanco is dangerous to navigate we secured three experienced polers, and a large dug-out thirty feet long. I had the men construct a shelter for us of banana leaves, and under it we put our gear, collections, and our two monkeys. The journey began at day-break. Two black polers stood in front, the third steered the dug-out with an immense oar.

At noon on the first day we came to the confluence of the Rio Guallabamba, which has its source in the Cordilleras between the towns of Otavalo and Ibarra. With the confluence of the two rivers, Blanco and Guallabamba, the river forms the Esmeraldas and continues under that name to the Pacific. The region traversed by this river is the most beautiful of Ecuador's forests. It is rich in fine woods, the full crown of the royal palm topping all, and giving the whole region a park-like atmosphere.

Our ride went smoothly enough. As the river moved along rapidly toward the Pacific the banks became less precipitous, and the river spread itself out over the land, reducing the volume of water in the navigable parts. We came to many seething rapids. The negro polers told us that when the river is raging the water comes

down with such force that one can be carried the one hundred miles from our starting point to the Pacific in six hours. But it takes ten days of poling to go up-stream.

Of the varied regions of Ecuador there is none that has the potential possibilities of this section of Esmeraldas. Fertile, rich, its main defect is its scanty population. This could be remedied, however, if plantations and industries were brought in. Most of the land is public domain. A good part of it, toward the Colombia border, is controlled by a vague treaty with the Association of English bondholders, made up of descendants or heirs of those who loaned money to Ecuador in the first days of her independence. Balsa, rubber, quinine, achiote, tagua nuts, and barabasco roots (from which comes rotinoe, the alkaloid used in insecticides), are indigenous to the region. Plantations worked in the manner of the Malay States are the only solution, the only way to control the natural resources of a region so well endowed as this coastal province.

On the second day of our canoe trip we came to Esmeraldas, a little sleepy city, the capital of the province at the mouth of the Esmeraldas River on the Pacific.

A town of less than ten thousand, it does not seem to have changed much in the last twenty years. Electric light has come, as well as a motion-picture theatre. Its population is 85 per cent negro and other curious hybrids between what was the indigenous Indian and the negro slaves. There is a mere sprinkling of white men and Syrians.

A large garrison of bare-footed serrano soldiers guard the place. An all-American cable station, a Government-controlled radio, a Hamburg-America Line office, some trade in tagua nuts, copra, rubber, and balsa wood is the height of Esmeraldas' commerce. Little negro boys with Ecuador's traditional garment for children, the short jacket, hawk their wares in the street. If we had not known this was Ecuador we might have taken it for some little village on Africa's Gold Coast.

In a few days the small coastal steamer of the Hamburg Line stopped at Esmeraldas. dropping anchor at the

mouth of the river. We bounced out on a small boat and quickly boarded it, for we were the only passengers. Our departure from Ecuador was quite undramatic and we were glad of that. Two years and a half of constant wandering left us a little blasé in the face of any new thrills. But Ecuador had still one last thing to exhibit to us : the small vessel had just shaped its course when the Captain came on deck, calling excitedly : "Sehen sie, Herr Doctor ? Sehen sie. Chimborazo !"

We followed his pointing finger.

To the south the white dome of the volcano of Chimborazo reared itself above the cloud masses and was plainly visible for some minutes.

"The first time, the first time," the Captain went on ecstatically, "that I have seen it from the sea in all my years on the coast."

We watched this magnificent phenomenon for some moments, until masses of clouds drifting by again obscured it. "Perhaps," said the Captain ironically, "Old Chimborazo came out from the clouds just long enough to say Auf Wiedersehen . . . well, well, scenery or no scenery I have to get this ship into Tumaco, the next port."

And as the ship made for the high seas and the coast of Ecuador gradually faded into a long thin tenuous line, we suddenly were overcome with homesickness, a certain nostalgia for the varied terrain of Ecuador which had been our home for so long. Like all others we had complained about inefficiency in the government, the ease of the people, yet now that we were going away from Ecuador we felt that those things were of small consequence. Time was moving along too rapidly. Ecuador could not stand still. And at that moment we were disturbed to feel that when we came back in the future the Ecuador we knew would be changed. Then, suddenly as if it wished to blot from our sight and our memory the sight of Ecuador, heavy banks of fog rolled down on the ship like a drop curtain and the Republic of the Equator was no more.

Looking back it seems to me that the real future of Ecuador rests with North America. We have in our

power, by constructive intelligent assistance, to take this small, but to my mind, exceedingly important country out from its monoculture and forge its future. Ecuador's turbulent past, its present political unrest, is due much to its impossible financial situation. For a hundred years it supplied 40 per cent of the world's supply of cacao (chocolate). Since 1915 its output of the chocolate bean has steadily declined until now it exports something less than thirty million pounds instead of one hundred million pounds as formerly. Cacao is to Ecuador what nitrate is to Chile, and her exchange, due to the lack of cacao exports, has steadily declined from the normal two sucres to the dollar to fifteen.

A more diversified agriculture could include innumerable products which we consume in our industries; and it would take Ecuador from that sphere of a 'one-product country,' a defect from which she, like most of the South American countries, suffers. The resources of Latin America are by no means 'inexhaustible.' Conservation of the products of Latin America is almost as important for intra-hemispherical solidarity as trade agreements or peace treaties. We have seen, in the past, that incorrect exploitation drove quinine and rubber from the South American Continent, its original home, to Malaya. More and more agricultural products will go the same way if we, who are the consumers of these products, do not realize that conservation, in addition to a systematized use of natural resources, is the only way the indigenous products of the Americas can remain on this continent.

'Pan Americanism' is an empty ideology unless accompanied by definite returns to its participants. Since we are the instigators of such an 'ism,' we must see that it works. The responsibility is ours. And it will be costly.

Agricultural assistance to Ecuador is the most important factor of such a programme; there is a very desperate need for a corps of practical botanists to survey the possibilities of Ecuador and to encourage, not only by suggestions, but by the creation of definite markets for the products that Ecuador can raise in her soil. The

great expanse of territory of Esmeraldas, two days' 'steaming radius' from Panama, virgin, comparatively unoccupied all these centuries, exhibits in one instance how utterly blind we are. Firestone puts up rubber plantations in Liberia; Ford far up the Amazon. Why? When there are sections such as Esmeraldas where the temperature (with a mean 79 degrees the year around) would provide ample space and good climate for such development. Cheap labour? (the essential in such plantations); well, the average salary per day in Ecuador is about eight to fifteen cents American.

However, if we wish to enlarge our markets in South America, we have to create the appetites among its people for our products. Ecuador has a population of approximately two million—three-fourths of which are Cholos of a very meagre purchasing ability and Indians with none at all. Ecuador has reached neither the optimum population in the century, nor the standards of living that its magnificent natural endowment could support.

Ecuador, in many respects, still remains in the neolithic age—the machine and its by-products are to them still a miracle, to be treated as such. They have not, as we have, grown with the machine (an Indian graduates from a 'g-string' to a zipper shirt—a Cholo goes from a mule's back to an airplane); so that the machine becomes part and parcel of their development, rather than something apart from them. Until that time comes the products of the machine and the machine itself will make little improvement on their society. Rather than that they should become manufacturers of products (which must remain inferior to those derived from a highly mechanized society), it would be better that we make available, at prices which make them purchasable, our manufactured products in exchange for their raw products. By this, we would not duplicate the manufacturing process.

Ecuador, too, needs new blood. Brazil, Uruguay, and Argentine, like the United States (in her earlier days), have constantly received new people from without. Ecuador has closed her doors, discouraged colonization,

and remained 'fixed' in the matter of her internal struggle between the relatively few people of white blood—the Cholos and the Indian.

A few of the colonization schemes launched by the Government, as in the case of the Austrian colony of Esmeraldas, ended in dismal failure, and the United States should never allow such schemes to be launched in North America to attract colonists unless the site, the people, and the plans are well investigated by competent 'dirt' investigators—those, in short, who would mount a mule and enter the regions to be colonized.

Correctly managed, colonization of Ecuador's undeveloped parts, whether they be by North Americans, Germans, Poles, or Italians, would do much to spur on the latent abilities of Ecuador's own population. If Ecuador is in search of a future and does not intend to be completely absorbed by Colombia to the north and Peru to the south (which many point out as a possibility), she will have to become more aggressive, both socially and economically.

Yet, slowly Ecuador's middle class is growing—that is the Cholo element. They are gradually absorbing what little white Spanish blood remains, as well as the pure Indian, and some day, perhaps, they will lose their feelings of inferiority.

The people of Ecuador have little to be ashamed of concerning their ancestry. Their ancestors, the Indians of Ecuador, perfected a culture for which their Spanish conquerors had admiration, if not toleration. The Cholo, a product of that conquest, feels inferior because white blood does not flow uncontaminated in his veins. This accounts for more in their turbulent politics than is superficially detected.

This political kaleidoscope changes from day to day, but I think the time will come when, with the race amalgamated, this will cease, and Ecuador will bridge the gap between the *serranos* and *costeños*, and, like the Incas of old, make this Republic on the Equator into a real unity.

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